

FYP Presentation No.3

Project title: That brown alternative material

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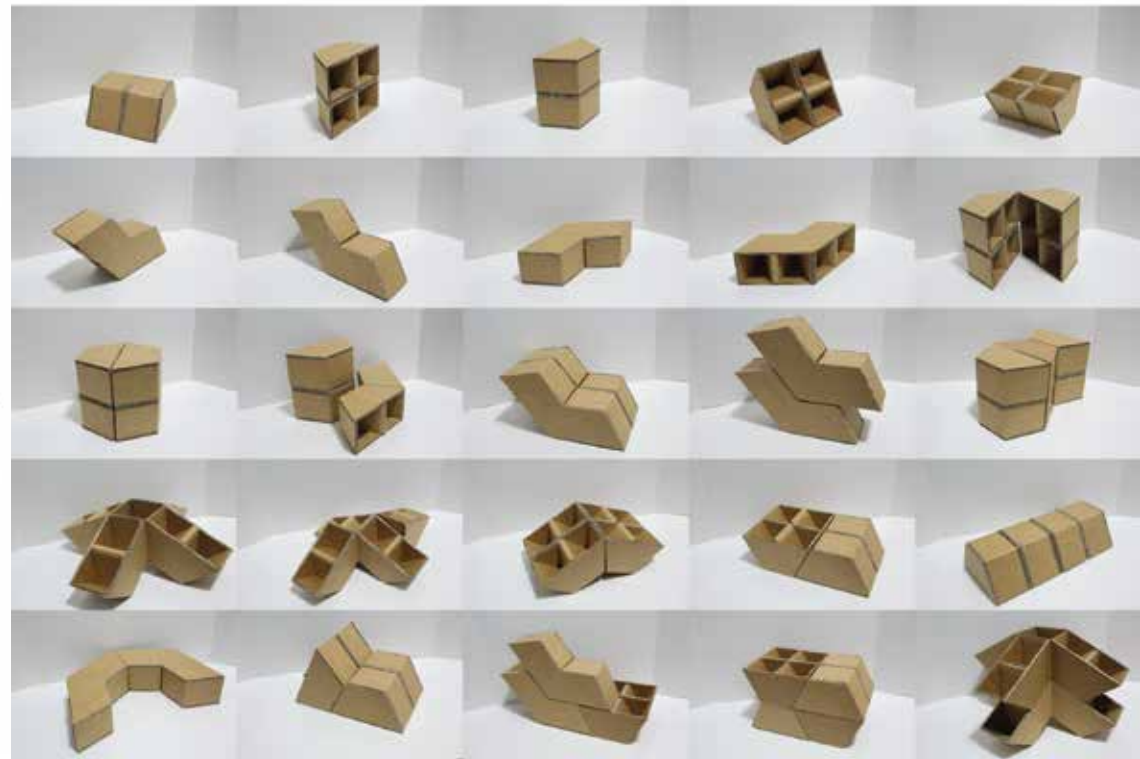
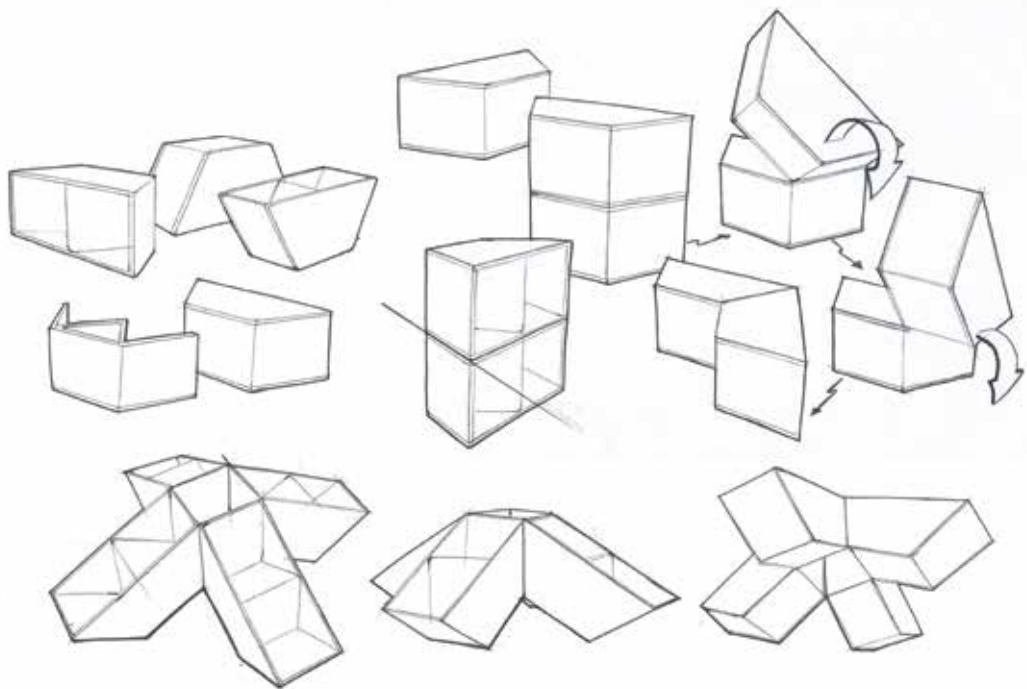
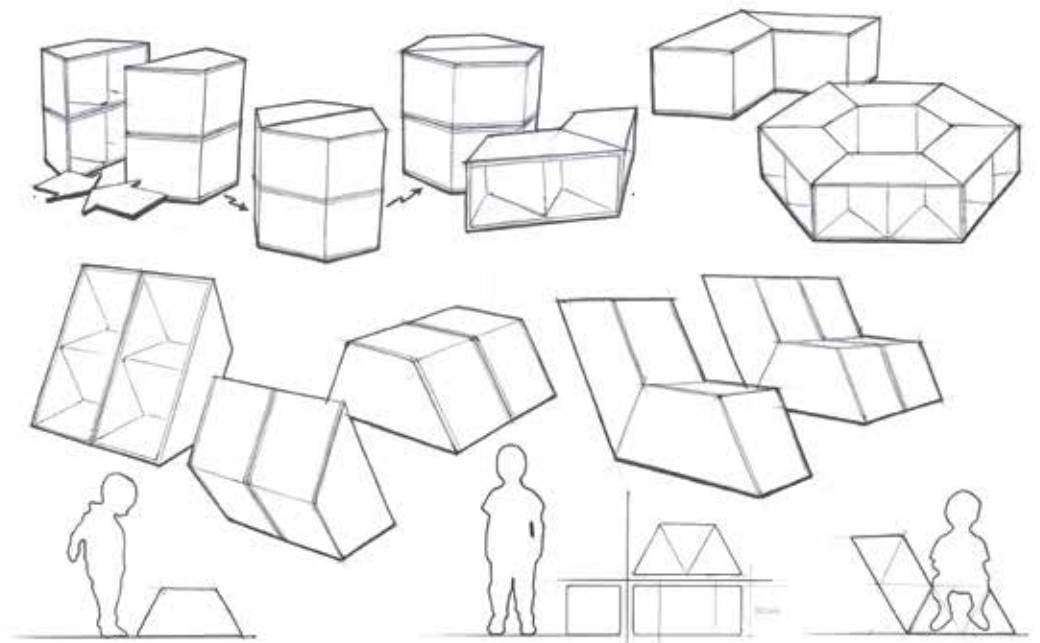
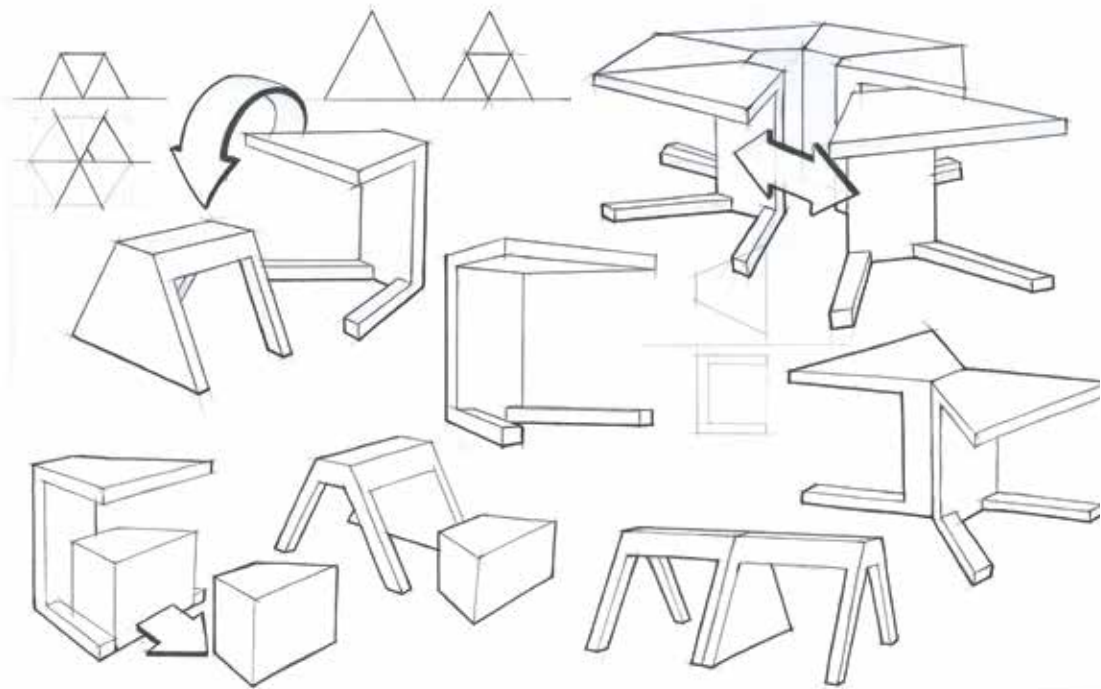
date: 13th November 2015

Recap from previous presentation

- Research findings about the value and characteristics of Cardboard through experimentation and case studies.
- Comparison of Cardboard with Plastics. (pros & cons)
- Possibilities of Cardboard as a material alternative for products.
- Justification of material usage.
(eco-friendly, easy flat pack, safe and cheap to replace .etc)

Design Objective

- To design a play furniture set for Pre-school kids. (3-5 years old)
- 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 cheap to produce and easily replaceable.
(an alternative to the more costly common plastic products)
- More developments of ideation along the way...

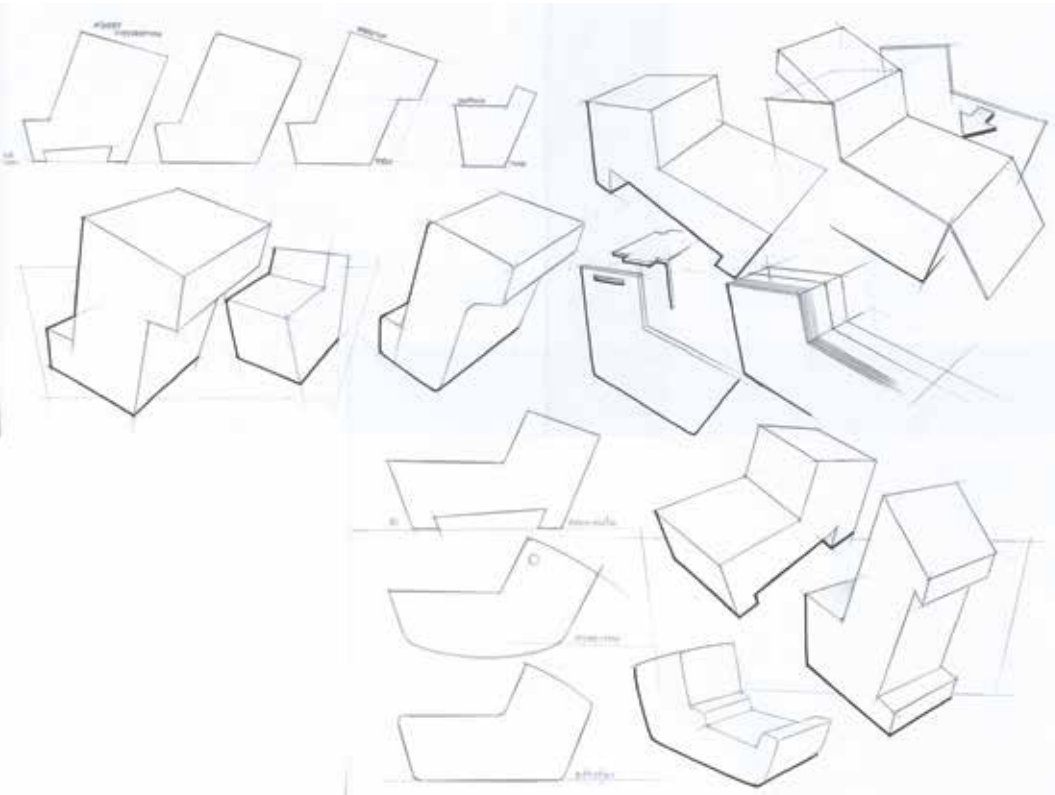
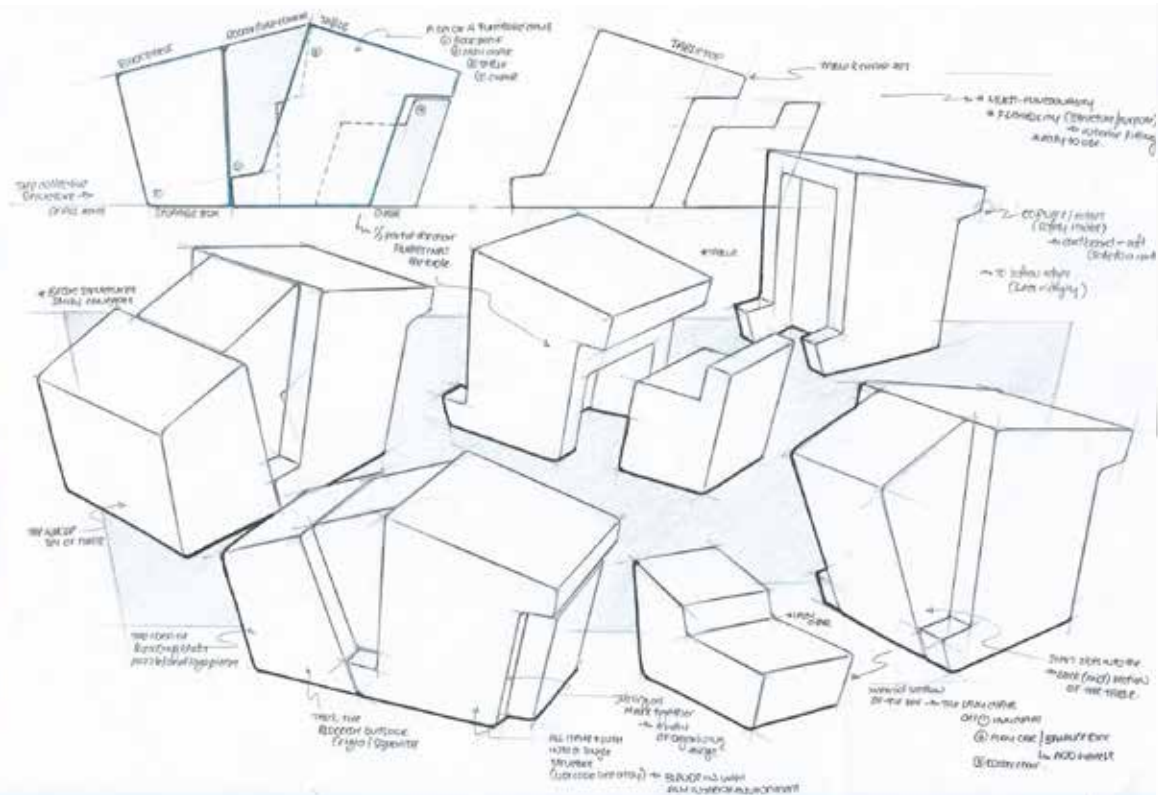


Keywords:

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

The Design Journey

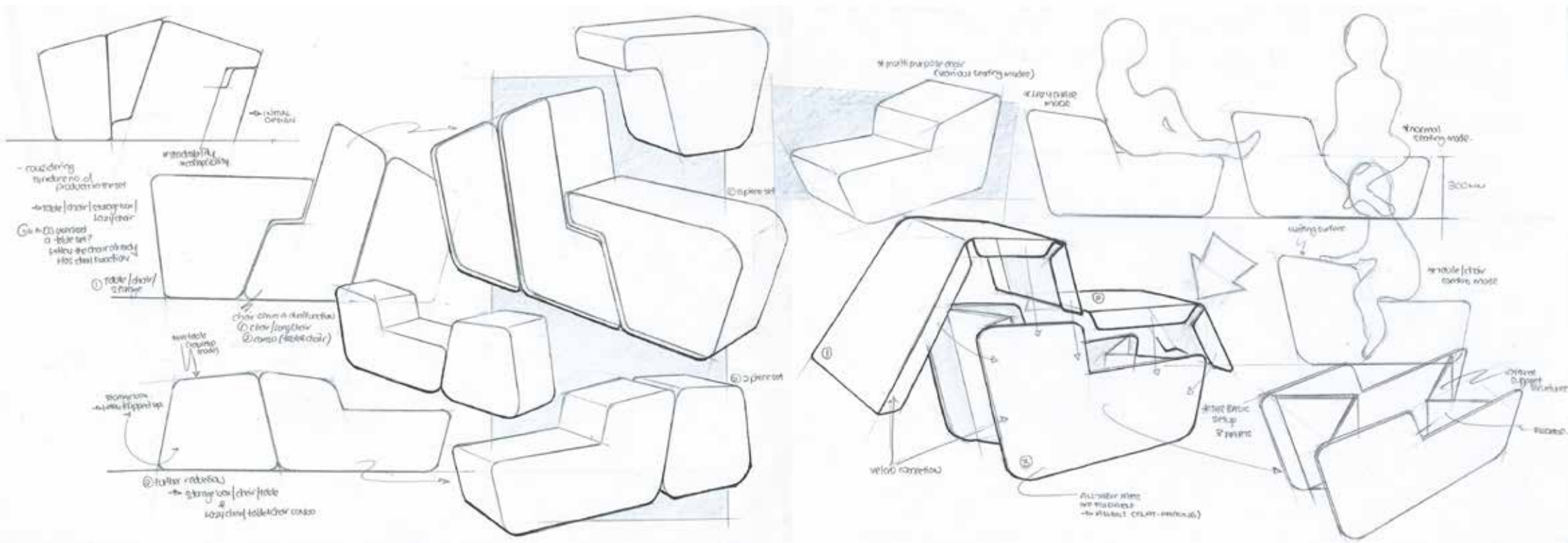
further development of idea after previous presentation



Development Sketches

evolution of concept and design refinements

Play Furniture set for Pre-school kids
 Set consists of: a Chair, a Table, a Lounge Chair/Lazy Chair & a Storage unit.
 Form inspired from basic shapes, the concept of building blocks & the game of Tetris.



Preparatory Sketches

for experimental model construction

A piece from the furniture set proposal was chosen to be made as a benchmark test model. (THE LOUNGE CHAIR/MULTIFUNCTION LAZY CHAIR)
 This is to experiment on the various methodologies in terms of construction and durability of the design.
 This will serve as a significant design study before moving on with the rest of the furniture pieces.

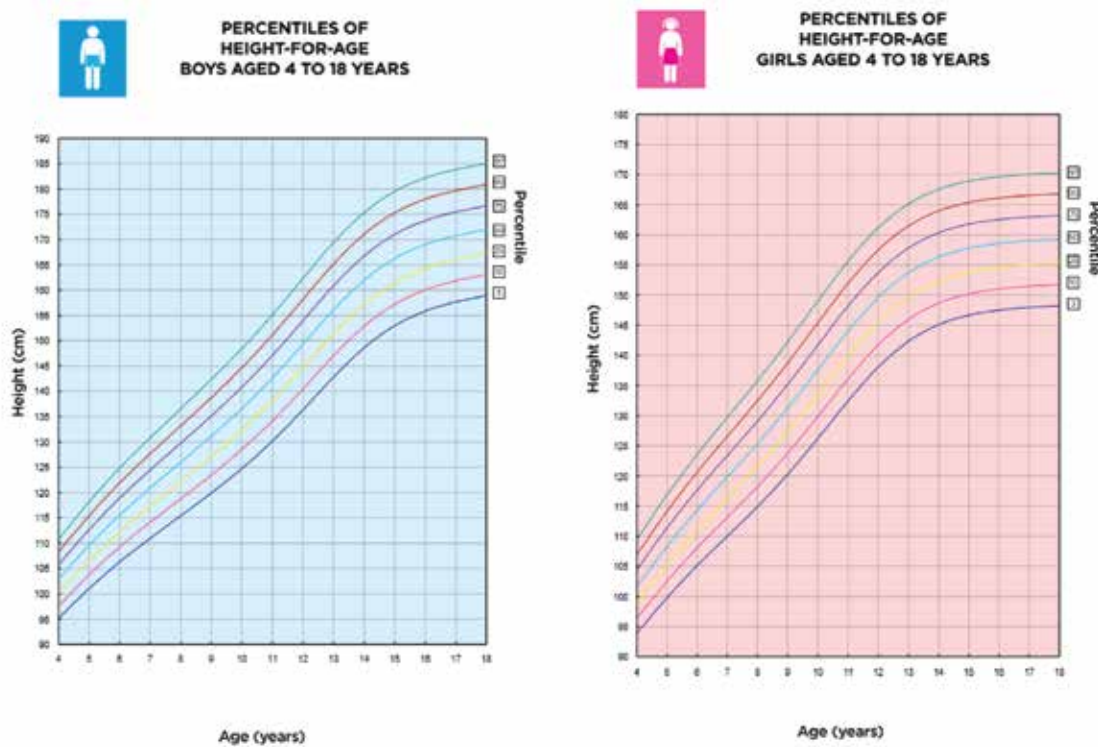


Figure 1.0
Singapore HPB Growth Chart of Boys & Girls aged 4 to 18 years (height)

Chair Height Guidelines

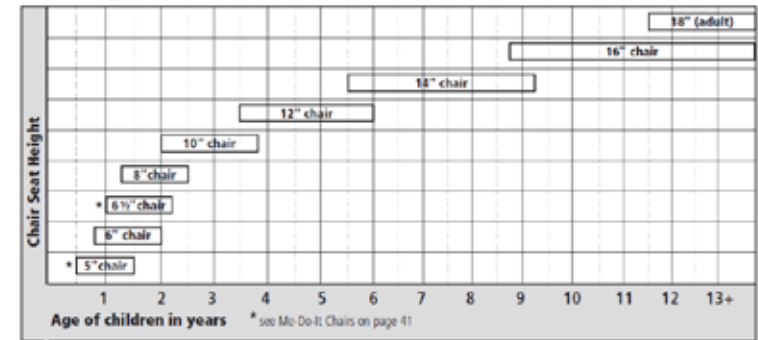
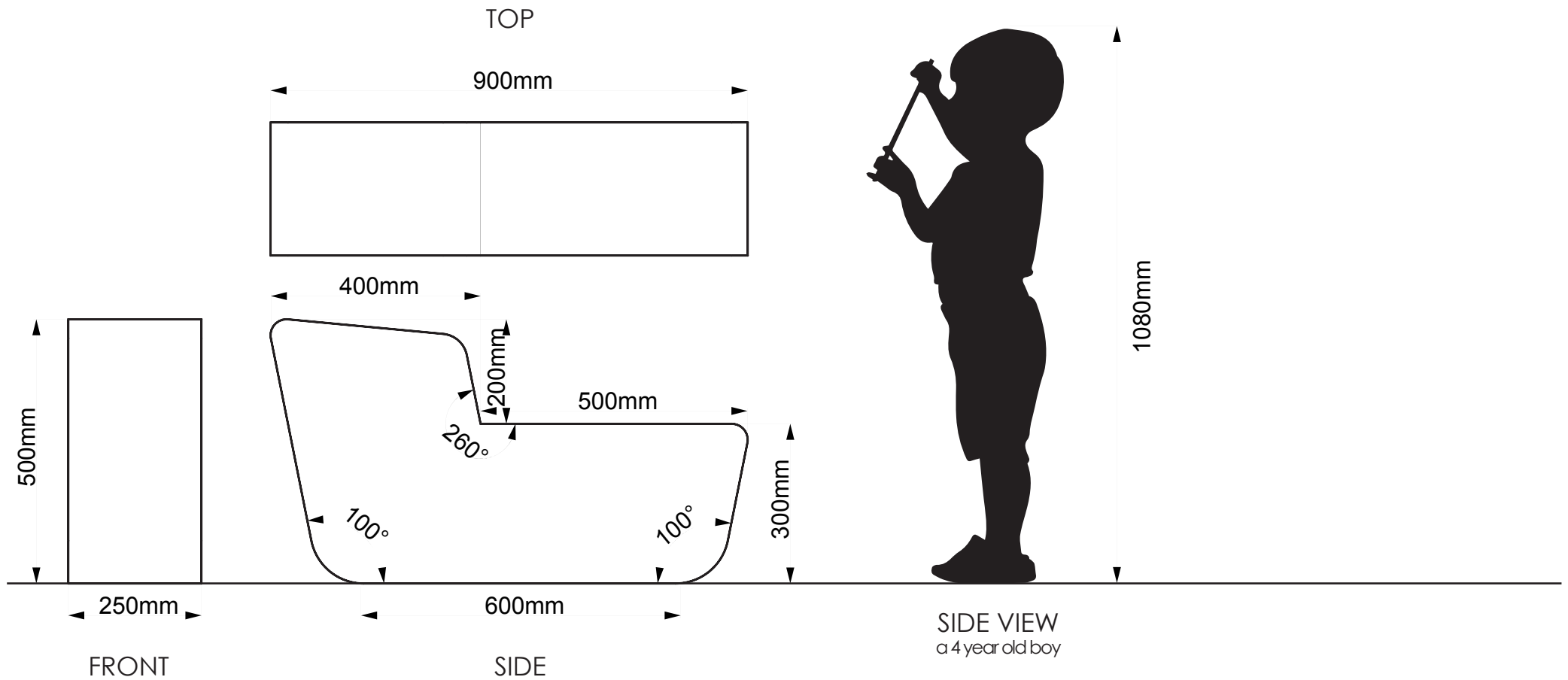


Table Top Height Guidelines

| Chair Seat Height | 5" | 6" | 6 1/2" | 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

overall structure measurements for full scale test model

Measurements are made in reference with the data collected from the HPB growth chart and the standard sizing of kids furniture in the market.

Proportion comparison.



Experimental Models

finding better solutions through full-scale mock ups and user tests

The trial & error making process (photo documentation)



Experimental Models

finding better solutions through full-scale mock ups and user tests

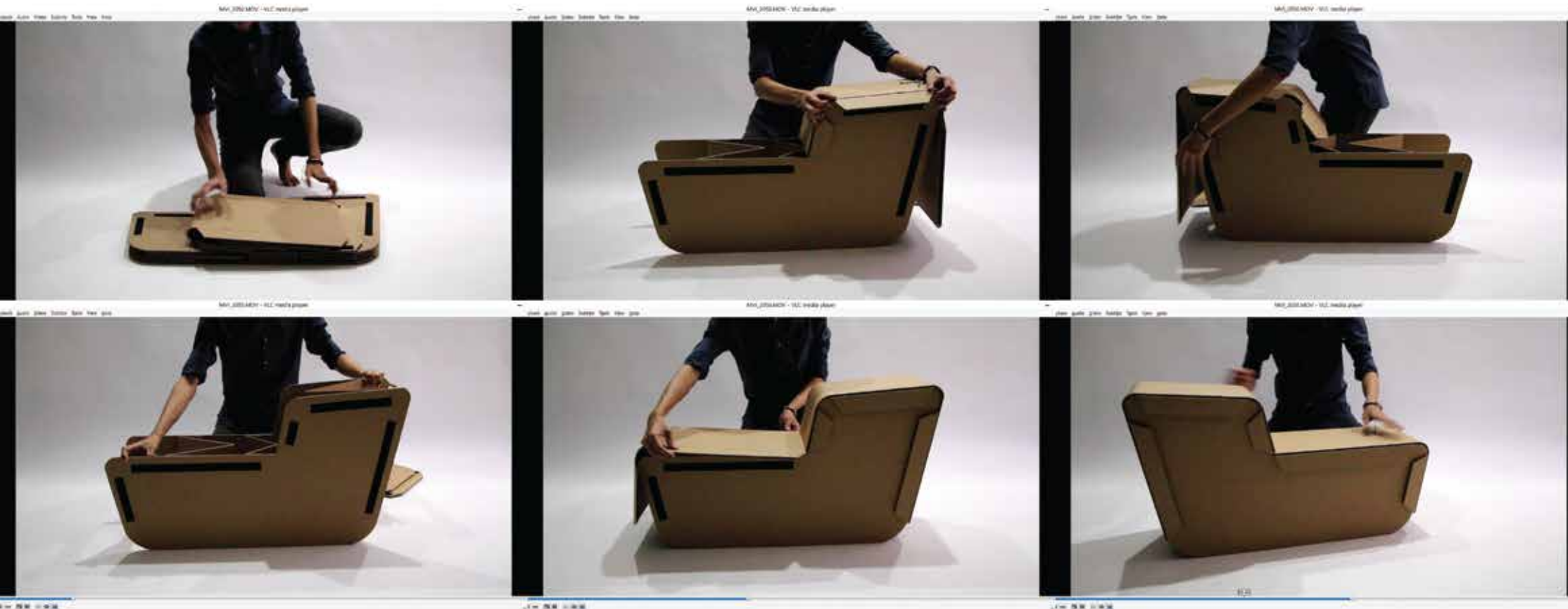
The trial & error making process (photo documentation)



Product Testing

finding better solutions through full-scale mock ups and user tests

Design considerations: Rounded edges (safety), Collapsible structure & Lightweight (easy storage), 3 individual Pieces (minimal components), Velcro connections (easy assembly), Cheap material (replacable/customisable), Multi purpose structure .etc



Product Testing

documentation for further improvements and design refinements

Screenshots from a videography documentation.



Product Testing

documentation for further improvements and design refinements

Screenshots from a videography documentation.



Product Testing

documentation for further improvements and design refinements



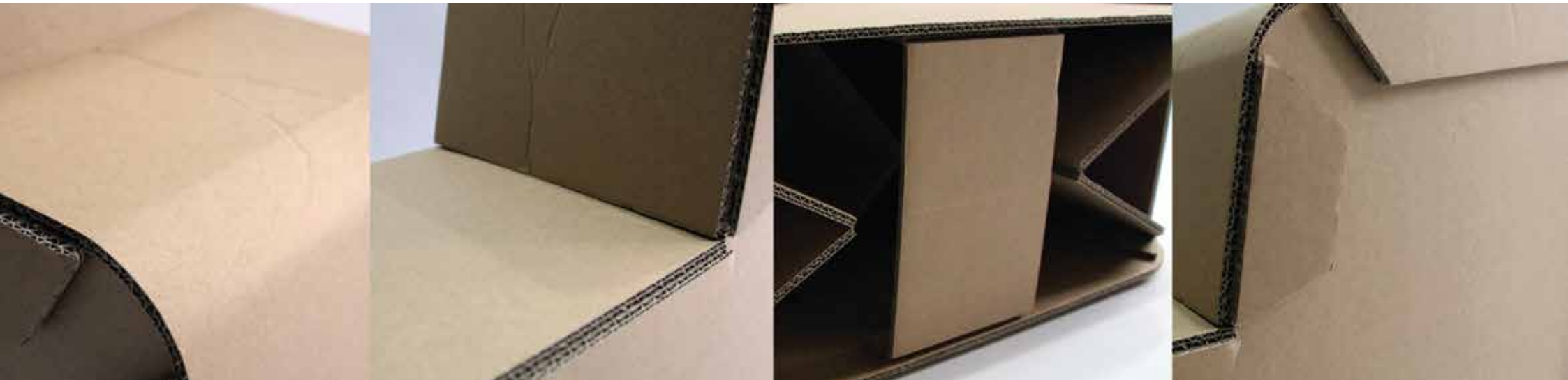
Product Testing

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)

- Test model is made of a single piece double ply 7mm corrugated board.
(which is strong enough for the walls of the model)
(double pieces of boards shall be used in the future for better durability)
- Test model is made of 3 separate part pieces.
(there is a possibility of reducing the pieces to two)
(but this depends on the default sizes of the boards available on the market)
(the longer the piece gets, the more likely it may be hard to control along the bends)
- Test model is made to connect via Velcro system. Easy to assemble/disassemble.
(which seems to be the best chosen idea for the design as compared to the traditional slotting method)
(it adds abit of cost but also improves the overall functionality)



Observations made from test

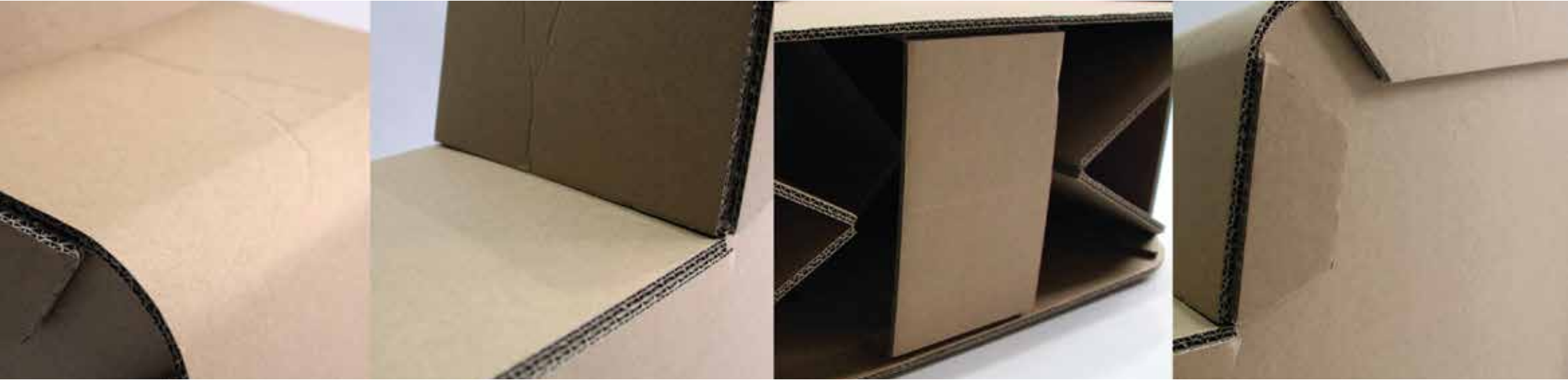
noting the important points for future design adjustments

the outcomes, problems/errors and possible solutions .etc

Observations made from test

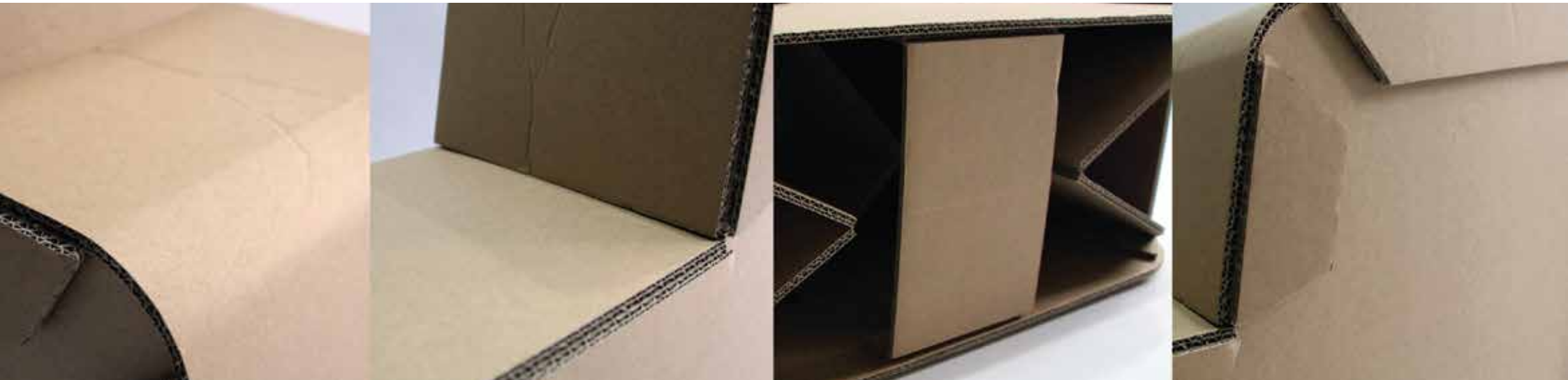
noting the important points for future design adjustments

the outcomes, problems/errors and possible solutions .etc



- The flaps on the sides that has the velcro affect the overall design in terms of structural form continuity.
(a method of not having these flaps will be considered next)
- Test models has minimal support on the mid-section.
(which results in bend marks over the centre part)
(re-analysis on the strength points of the structure is important)
- Test models only have the top and side shell covering
(a base shell layer may be considered in the future for stability)
- Test models uses more cuts than folds
(surface scoring technique may be experimented next)

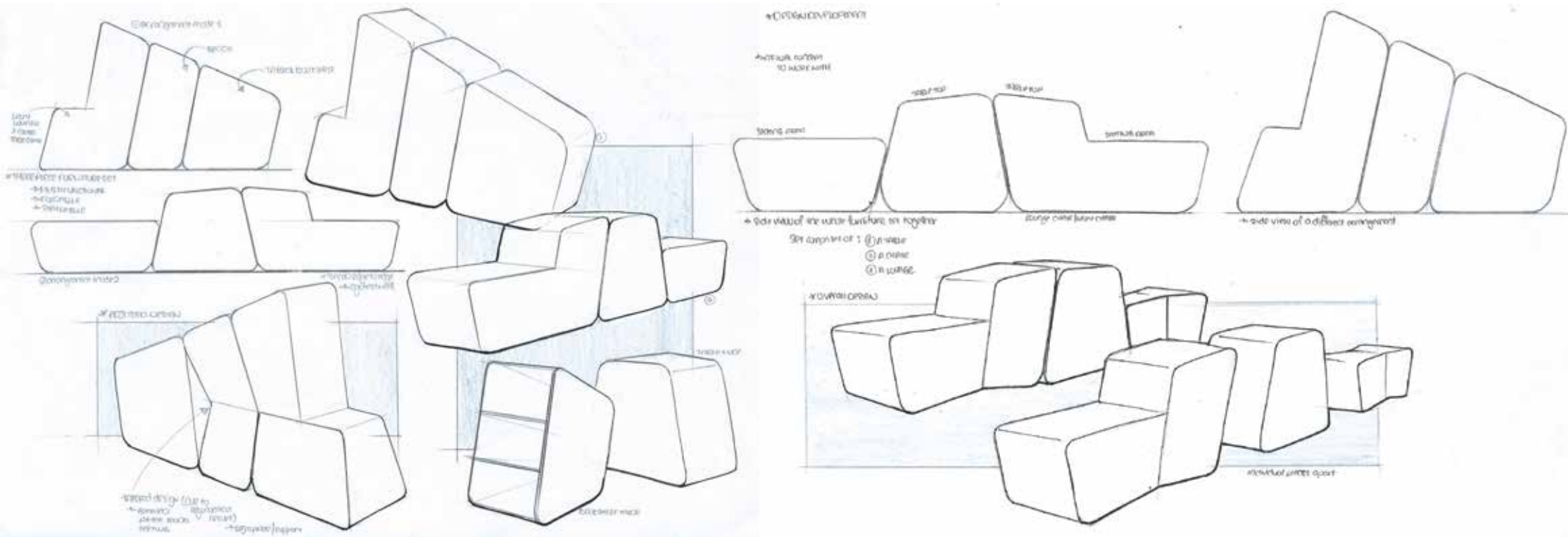
- Test model has a straight profile form throughout.
(which is actually abit thick for user to sit in the horse riding position)
(to taper the mid-section to allow the user to sit without opening the legs wide when using the table top mode)
- Test model sizing is just right for both the mom and child when in the interaction mode.
- Test model is durable enough to hold the weight of an adult.
- Test model is stable throughout the testing process.
- Test model is considerably light weight thus, it is easy to handle and move around.
- Test model looks abit raw with the main material covering 95% of the design
(a mix of element may be possible in the next adjustment)
(to mix fabric/carpet with the design) (adds comfort and enhances design)
(a removable fabric piece that is embedded with the outer shell parts of the pieces)



Observations made from test

noting the important points for future design adjustments

the outcomes, problems/errors and possible solutions .etc



Further Development Sketches

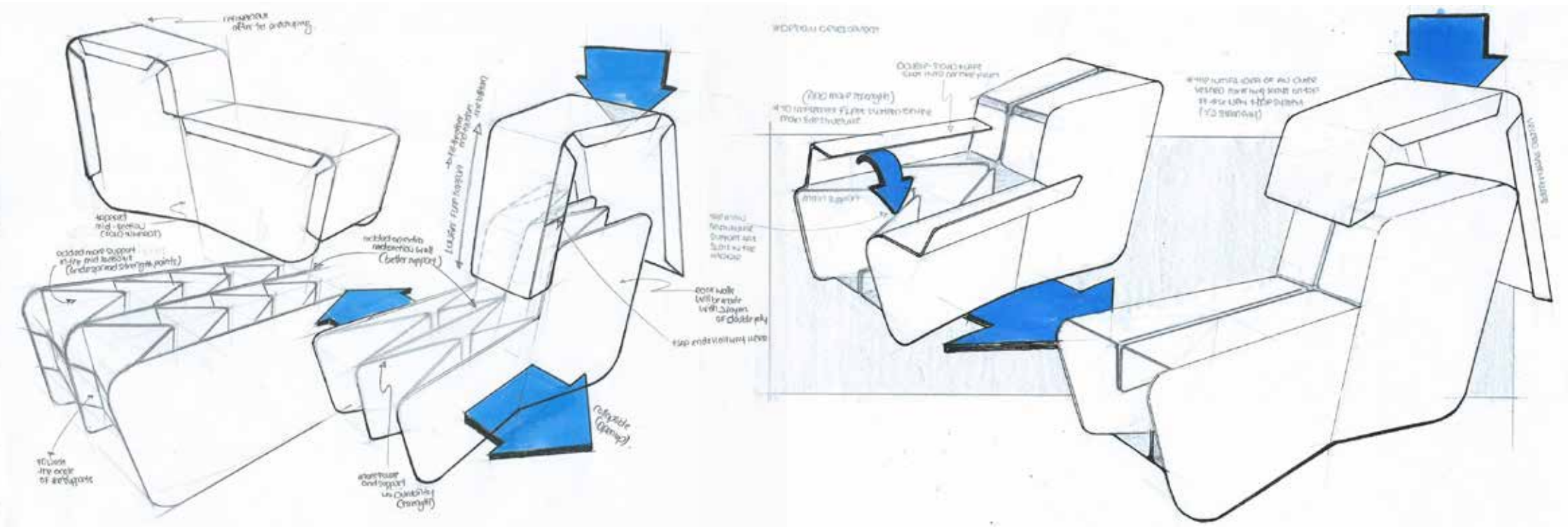
focus on the methods of construction and functionality issues

Re-consider the number of product pieces in the set (as individual pieces has multiple functions)

Add multiple usage to a piece which allows reduction of additional similar function piece.

Still consider the collapsibility and stackability factors in design.

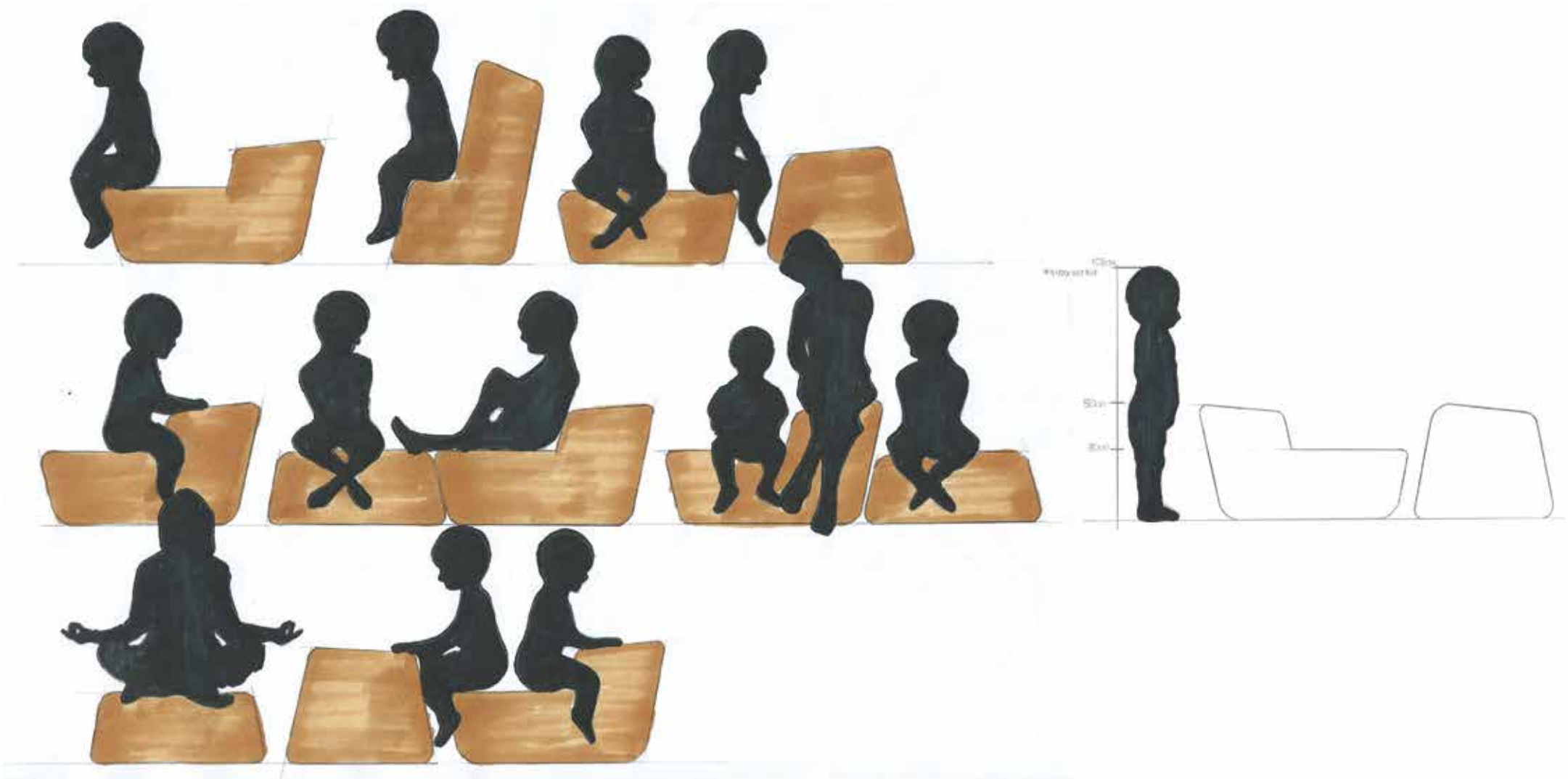
To finalize the overall form of the entire set for the next refinements.



Further Development Sketches

focus on the methods of construction and functionality issues

- To add more interior structural support (triangular sections)
- Reanalysing of the strength points (keeping in mind the aspect of foldability)
- To introduce a more durable way of stabilizing entire structure.
- To improve the exterior shell and flaps part design. (to cover the entire perimeter)

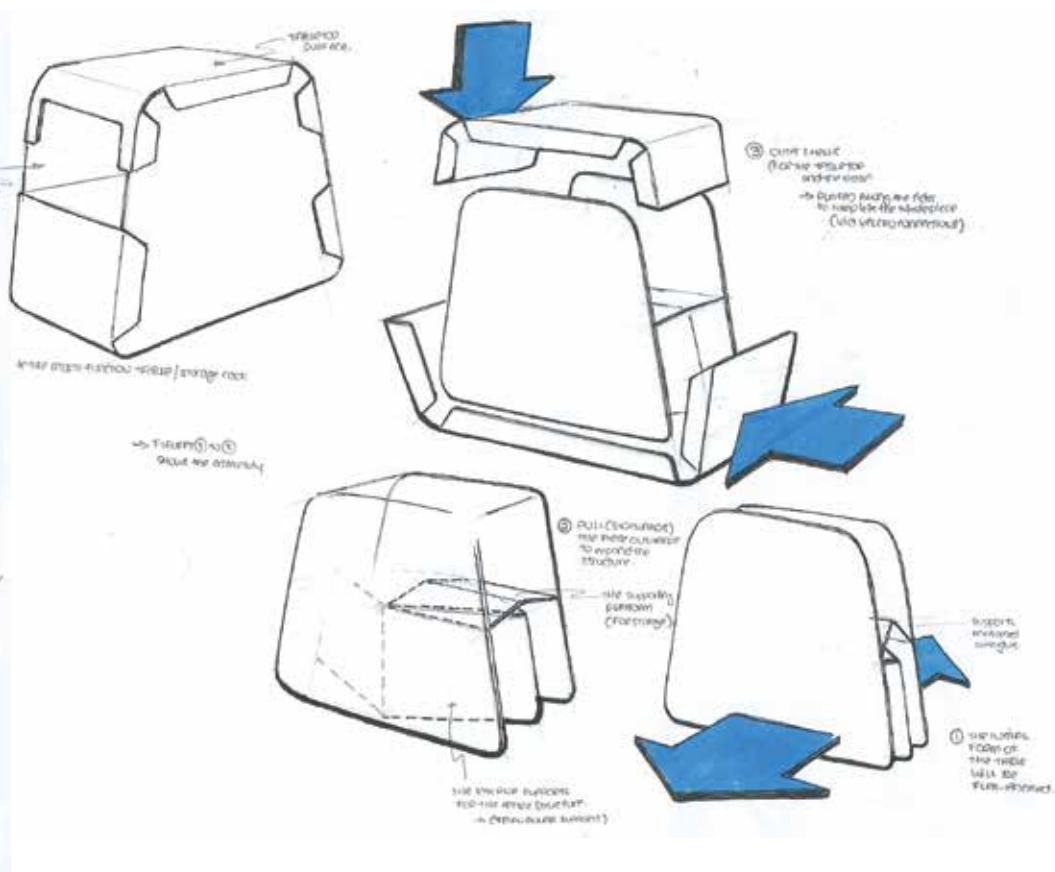
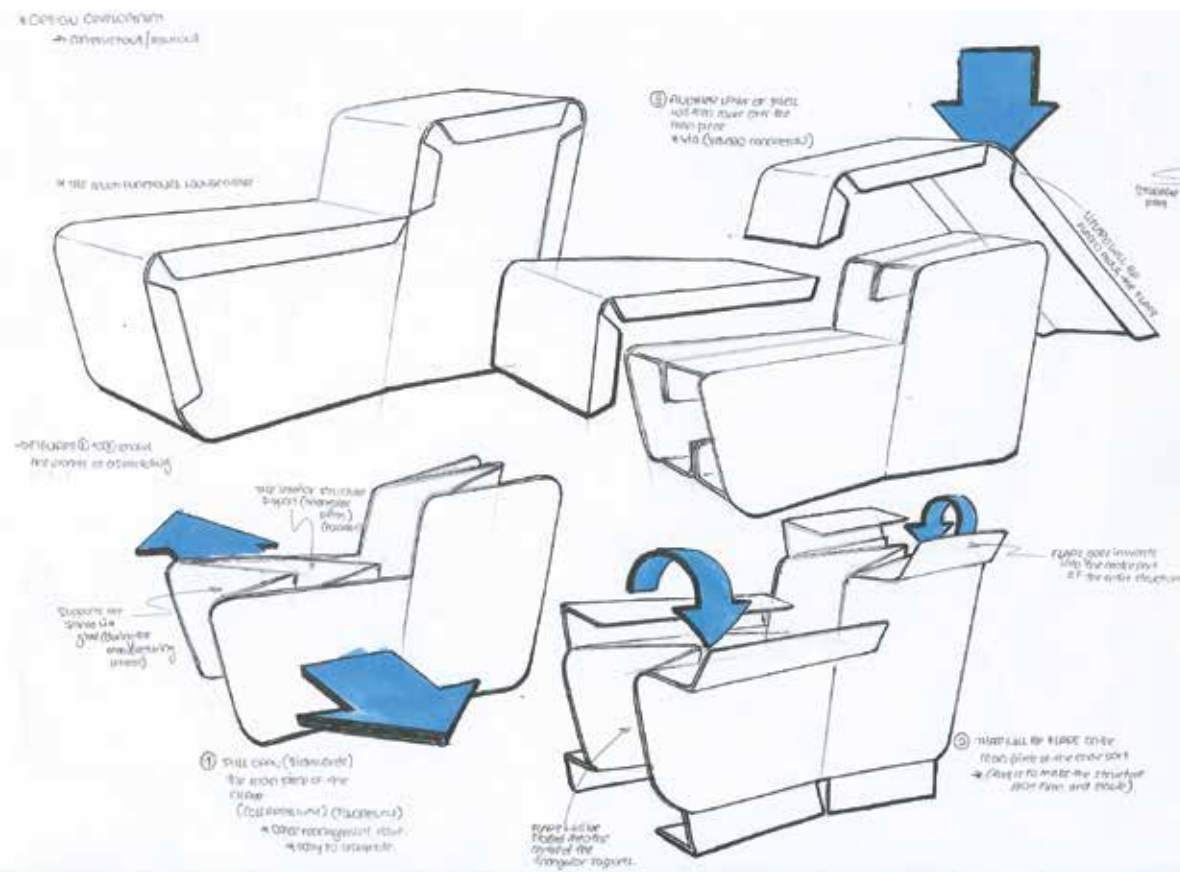


Further Development Sketches

focus on the methods of construction and functionality issues

Study of all the possible ways of using the pieces in the design set. (looking at scale & proportion)

*Design allows interaction between users. (Mom & Child reading session/Children & friends or siblings play time)



Further Development Sketches

focus on the methods of construction and functionality issues

Refinements of the ways of manufacturing and implementing methods to the other set pieces.
 The Lounge combo Table/Chair and the Table with Storage compartment.

Corrugated Board (75%)



Figure 2.0
corrugated board stacks



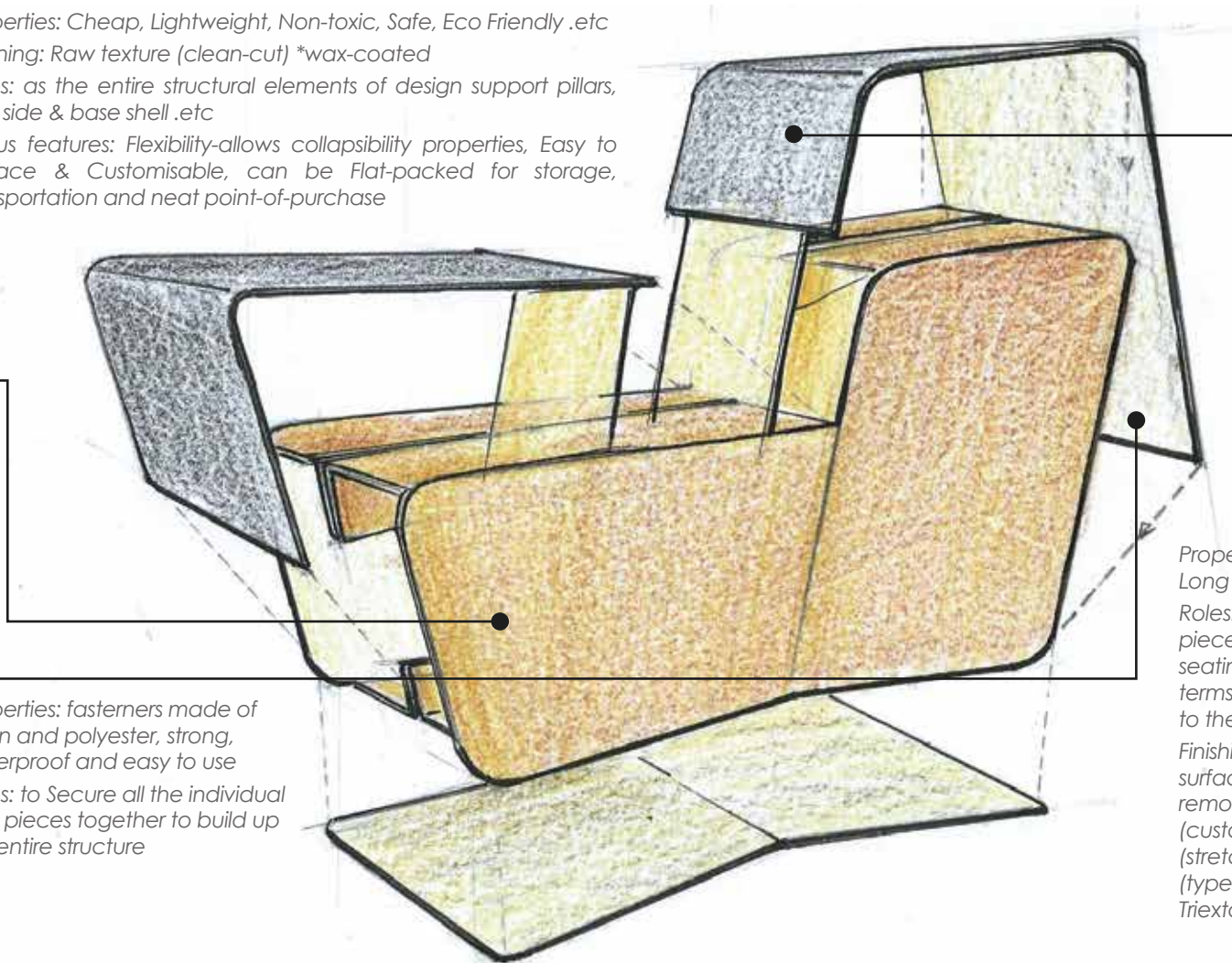
Figure 2.1
corrugated board texture

Velcro (5%)



Figure 2.2
velcro system

Properties: Cheap, Lightweight, Non-toxic, Safe, Eco Friendly .etc
*Finishing: Raw texture (clean-cut) *wax-coated*
Roles: as the entire structural elements of design support pillars, top, side & base shell .etc
Bonus features: Flexibility-allows collapsibility properties, Easy to replace & Customisable, can be Flat-packed for storage, transportation and neat point-of-purchase



Fabric/textiles (20%)



Figure 2.3
rolls of carpet



Figure 2.4
squares textiles

Properties: Nylon textiles, Easy maintenance, Long lasting, Safe for kids

Roles: as the surface Finishing for the shell pieces, To add comfort for the user on the seating surfaces, Enhances the entire design in terms of visual and tactile aspects, Adds value to the whole product

Finishing: Material will be embedded to surface area of the shell pieces or be a removable additional element (customisable/washable) (stretchable fabric over cardboard) (types of fabric/textiles to look onto: Nylon, Triexta, Olefin and Polyester)

Further Design Development

choice of materials and future refinements

Considerations of the other supporting elements in design.
 To refine the part on the shell pieces with the multiple flaps.
 New position for Velcro positioning.
 To think of a better way of fusing fabric with cardboard material.
 Analyse of several durable fabric types.

Bibliography

References of Images

Figure 1.0
Singapore HPB Growth Chart of Boys & Girls aged 4 to 18 years (height)
<http://www.hpb.gov.sg/HOPPortal/health-article/632>

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Chair & Table top height Guidelines by communityplaythings
www.communityplaythings.com

Figure 2.0
Corrugated board stacks
<http://www.wessex-packaging-salisbury.co.uk/system/site/uploads/content/images/New%20landing%20pages%202013/cardboard%20boxes/Cardboard1.jpg>

Figure 2.1
Corrugated board texture
http://bdfons.com/upload/cardboard_texture995.jpg

Figure 2.2
Velcro system
http://www.fastcocreate.com/multisite_files/cocreate/imagecache/1280/article_feature/1280-velcro-rebranding.jpg

Figure 2.3
Rolls of carpet
<http://www.crosscom.com.sg/wp-content/uploads/2015/03/cleaning-carpets.jpg>

Figure 2.4
Square textiles
<http://www.asiapacificimpex.com/wp-content/uploads/2015/07/carpet.jpg>

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Thank You!