TIME YOU ENJOYED WASTING WAS NOT TIME WASTED

MDES PROJECT: PRODUCT DESIGN

RESEARCH AND DESIGN

ELLIOT MACDONALD

PLEASE HAVE A GO ON THE SEESAW!
ALL MY RESEARCH HAS TOLD ME THAT PLAY CAN BENEFIT WORK.
SO, WHILST YOU READ THIS, THE SEESAW IS AT YOUR DISPOSAL.

IF NO IMAGE REFERENCE IS SHOWN PLEASE
ASSUME THE IMAGE IS THE AUTHORS OWN

PAGES 5 - 13 ILLUSTRATE MY INITIAL PROJECT RESEARCH PRESENTATION

PROJECT VALUES

- IMPROVE CONNECTEDNESS.

- I'D LIKE TO LIVE IN A WORLD WHERE WE LOOSE OUR INHIBITIONS MORE AND I FEEL LIKE PUBLIC FUN IS AN EXCUSE TO DO THIS. AND IN TURN, CONNECT US MORE.

- SPLITTING FROM EUROPE LEFT AN ATMOSPHERE, I DIDN'T WANT TO LEAVE BUT I WANT TO HELP BRING US BACK TOGETHER.

- A REDUCTION OF SOCIAL CARE MEANS COMMUNITY ACTION TO HELP COUNTERACT THIS SHOULD RISE.

- THE EVERYDAY IS EFFICIENCY BASED, SOCIETY IS FOCUSED ON PROGRESS BUT WE'RE FORGETTING TO FOCUS ON FUN.

- BRITISH HOUSING MOVING BACK TO PREFABS - NOW MORE THAN EVER WE NEED TO FEEL BENEFITED BY EACH OTHER'S COMPANY.

"THESE DAYS EVEN INSTANT GRATIFICATION TAKES TOO LONG."
CARRIE FISHER

SOCIETY NOW

"Prioritising it might seem frivolous – we live in a planet-sized tangle of problems and injustices, after all. But problems need creative solutions. What if play could help us find them? What if play was one of them? Dr Brown is just one scientist who suggests it is. Einstein was another. In his words: "Play is the highest form of research." There is, the theory goes, a reason Archimedes shouted "Eureka!" in the bath, not the laboratory"

"We're all convinced we're too busy to do it, and that's no accident. Our culture values busyness – it is how we measure goodness... these days politicians differentiate in terms of productivity: "jobseekers", "the hardworking poor", "hardworking families" – busyness has replaced godliness, but the new language is just as unhelpful as the old."
(Lauren Laverne, 2014)

"Only boring people get bored" Westworld character – Dr. Robert Ford

"With so much to occupy us these days, boredom should be a relic of a bygone age – an age devoid of the internet, social media, multi-channel TV, 24-hour shopping, multiplex cinemas, game consoles, texting and whatever other myriad possibilities are available these days to entertain us."
(Sandi Mann, 2016)

<u>This research has brought out some questions:</u>
What kinds of play can surprise and involve us from day to day?
Is the source of fun/play within us?
What kinds of tools or designs can help us create and play without getting bored?
Why are kids better at playing than adults?
How would society function if we all had a child's attitude to play?

SOCIETY POST BREXIT

In Britain we have a conflict of opinions, 52-48% to be exact. The huge decision to leave Europe was littered with difficulty in a 'post-truth' 'fake-news' era. Leaving me feeling slightly bewildered and alone at the thought of Britain standing by itself.

This widespread need to disconnect relied on fear, fear of each other. A lack of trust underpinned by a political swing to the right has left us focused on the me and now, scapegoating immigrants.

To take a lesson from our European neighbours, Denmark have come out on top of the World Happiness Report, the reasons for which are summerised below by the telegraph:

"Denmark's success can be attributed to its good life expectancy (80 years, well above the global average of 71), GDP per capita ($44,916, according to World Bank figures, placing it 17th overall), free/tax-financed health care, and enviable welfare system, which has made its wealth gap one of the world's smallest." (Oliver Smith, 2016)

In Britain I feel we have unbelievably polite and ordered spirit, a strong willingness to correct what we deem to be wrong or unfair. On a day-to-day level this spirit can be seen exemplified in our never-ending cues or letting each other out in rush hour.

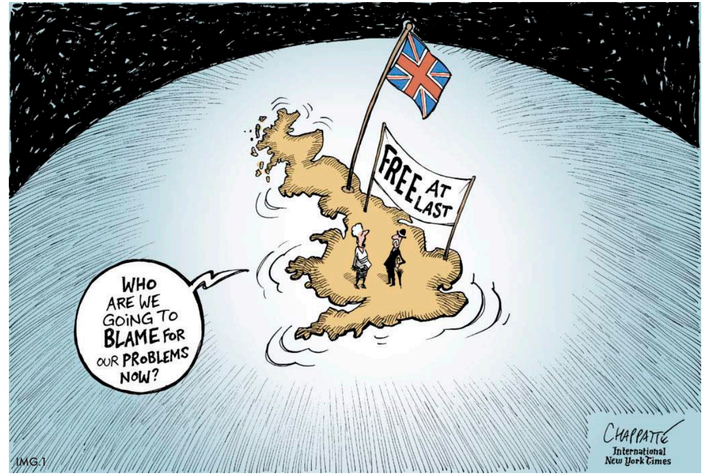
Inhibited by our politeness, we should relish a differing opinion from time to time, take note of what our Europeans are doing so well and replicate it. Its easier said than done with the government and political system in the unorganized state its currently in so...

As a designer I feel I can make a small difference in the British mindset, reducing fear and increasing trust between us as a nation of multiple races, genders and religions.

Finding the common enjoyment of play, within a small group of people is where I should start. I don't wish to affect everyone as I feel this will dilute the message of play. There are two things I feel need to happen in order to make us a happier nation:

1. A general reduction working hours, following the Swedish example because in the UK "More than two-thirds of employees say they are working longer hours than two years ago, but only 10% believe they are more productive." (Phillip Inman, Guardian, 2016)

2. An increase in daily play, with more free time we will be able to explore more vocational activities, finding ways to connect us outside of progression based tasks.



IMG.1

WHY PLAY MATTERS

"The beginning point of play, when the infant is old enough to have its first social smile. What happens, spontaneously, is the eruption of joy on the mother face, she begins to smile so does the baby.
If we had receptors attached to their heads we would see the right side of both their brains light up enormously.
This connection is what every bit of more complex play builds on as a base"


IMG.2

"Play doesn't have a particular purpose...
if its purpose is greater than the act of doing it, its probably not play"


IMG.3

"The basis of human trust is established through play signals. And we begin to loose those signals as we become adults, that's a shame. I think we've got a lot of learning to do"

"Signals tend to be vocal, facial, body, gestural.
Collective play helps us gain safety through the sharing of these signals."
(Dr. Stuart Brown, 2009)


IMG.5

EVENTS RECORDS CULTURAL

But why do these signals have to be so undignified, with the stigmas surrounding adults play can products act as these signals?

There are existing signal for play out there, most examples centre on events record breaks or cultural reasons. But all of these examples have reasons for play, a snowball fight is synonymous with Christmas feeling – Christmas and seasonal change therefore being the signal for play.

LUMIERE

"In 2015, 200,000 people came to Lumiere Durham to experience a spectacular programme of 29 light installations. Highlights included a 'whale' in the River Wear, mysterious fog tumbling down from the Cathedral and a projection that showed locals climbing the viaduct." I also attended the event; it was cram-packed full of people. So much so it was hard to move, I feel this shows the potential for playful events.
(lumiere-festival, 2015)

GIANT WATER BALLON FIGHT

8,957 participants, achieved at the University of Kentucky (USA) 175,141 water balloons were used during the fight. Records are a third example of opportunities for play. To keep doing better is a huge general driver in society, a fun event is one way to harness this for play. (Guinessworldrecords.com, 2011)

SNOWMEN

"The earliest evidence he could find was a rather shaky illustration of a snowman in a Book of Hours, dated 1380, from the Koninklijke Bibliotheek, in The Hague."
(Kate Ravilious, 2010)
The novelty of the weather is a signal. When it snows we feel compelled to have fun with it as it's a temporary state, this however also routed in culture. Culture is probably the largest driver here.


IMG.6


IMG.7


IMG.8

RESTRICTIONS

- Don't add an object to the pile of existing surplus.

- The current UK economy and where it's going.

- Philippe Stark Design and Destiny, design for humans.

- Don't force it offer it.

- Adults in this day and age get bored very easily.

- Not Memphis design

- No humour

- Trying to influence everyone means you influence no one.

INITIAL IDEAS

- Open source adults playground alongside a graphic campaign aiming to challenge our attitude to having fun.
(Open source because i'd like to bring the idea of adults having fun to the market through community action (maybe artist/designer community).)(there are adult playgrounds in the US but all are focused on fitness)

- Maybe a pop up tree houses/swings open source

- Toys - Laser tag for adults, product designed for disassembly maybe 3d printed.


IMG.9

Feedback
- What's the final thing?
- How will it be assessed?
- Keep an eye on documentation.
- We wont to reward the risk associated with the project but be cautious

Reflection
My project has no definable end. Unlike many of the designers that presented their initial research today my outcome does not already exist.

If I choose a product to design now, I'm safe. I can predict how to make this a 'good' project.

But.
I want this project to define my approach to design, my approach is risky, and the parts of a project that I enjoy most are the vague exploration steps before the 'product'.

Its exciting to delve into a topic not knowing what's coming out of the other end but I undeniably wish to use to skills of a product designer to do it.

So, I am not going to define an outcome just yet.

Project comments:
- Is there a kind of Network of activity that can allow people to have fun?
- Engaging adults is a communal thing, do the groundwork research.

Reflection
The fundamentals of play need exploring. I need to define play for myself, using other opinions, in order to refine the projects direction. This should help direct me to common play trends and hopefully identify a network.

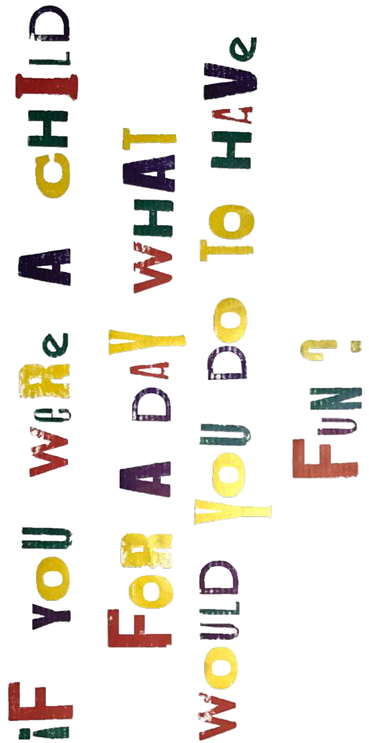
OPEN QUESTIONNAIRE

To get an insight into how adults would play if all inhibitions were removed I've stuck up some posters in the faculty building. The posters poise the question 'if you were a child for a day what would you do to have fun?'.
Here I'm aiming to find a common theme amongst adults play requirements.

I've asked everyone to imagine a child like scenario for two reasons, one is to remove any inhibitions adults would place on the activity of play. The second reason is to reduce the influence of the adult's interests now, imagining your history as a child should avoid people expressing interests such as football or painting, hopefully this will level the field of answers.

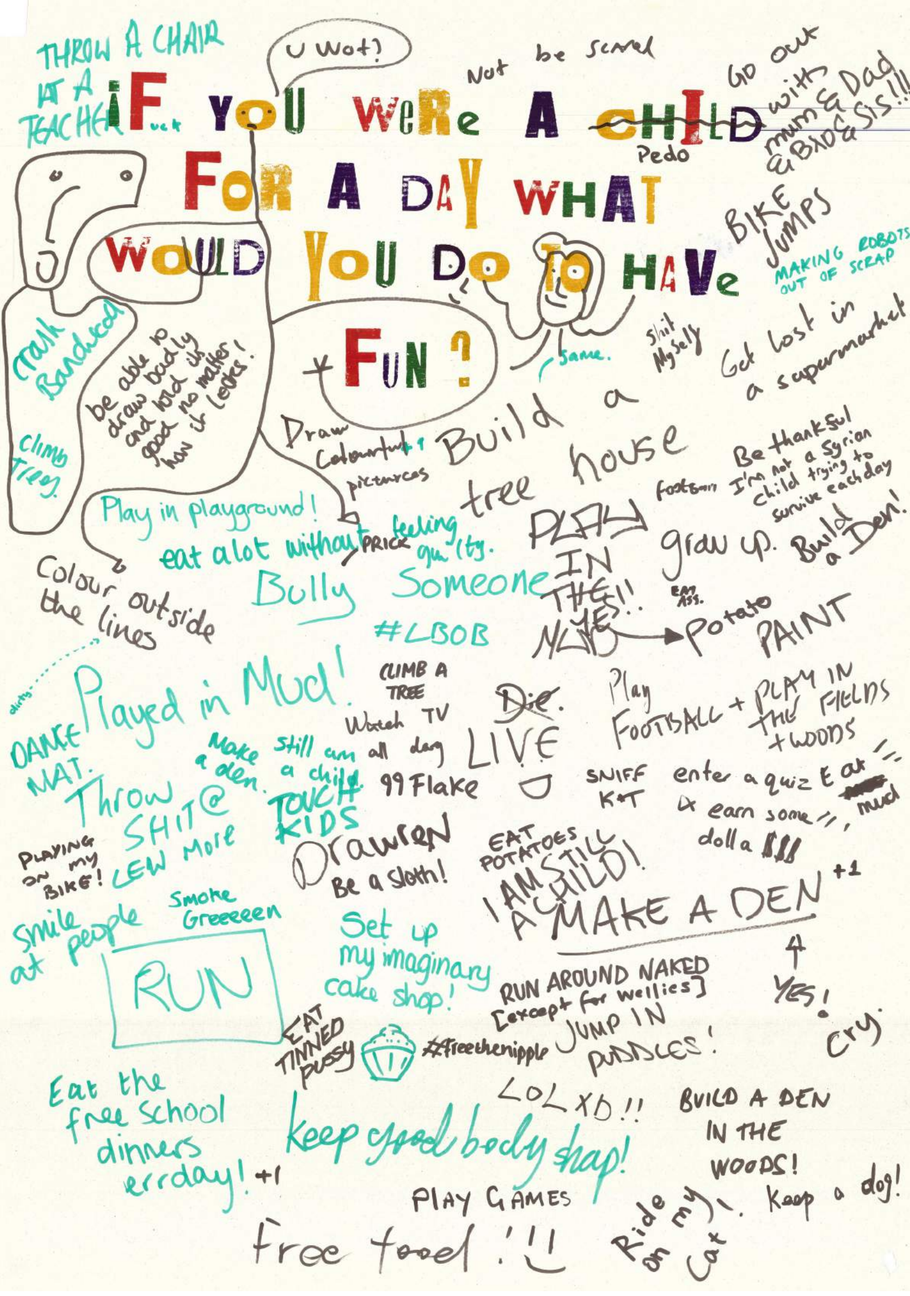
The time restriction of a day suggests that you don't have long to do it so urges the answer to be succinct and direct. This should make it easier to cross reference the results.

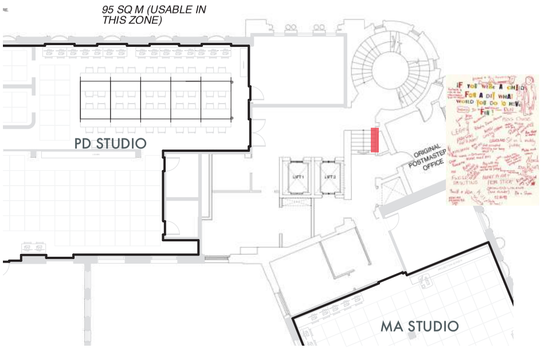
p.s please flip me portrait for the next few pages :)




IF YOU WERE A CHILD FOR A DAY WHAT WOULD YOU DO TO HAVE FUN?
Build A den!
DIVING OFF CLIFFS.
Make a den / treehouse.
Bouncy Castle
Dig a Hole
Go on a zipwire!
Go Beach Build Sandcastle Go Swimming.
WRESTLE.
DRAW ON MY WALLS!
THE ARNOLD MARATHON.
Build a dam in a stream.
GET MY BIKE, ROUND UP THE SQUAD! HAVE A DAY AT PARK.
THROW OBJECTS AT PEOPLE!!
AND FOOD
Food fight!


pretend 2 B lionel ritchie
IF YOU WERE A CHILD FOR A DAY WHAT WOULD YOU DO TO HAVE FUN?
Go back & ride all the rollercoasters I'm too big for!
WEED
go to first shower room
RUN
Same!
Draw Dick's
LEGO!
play sims for 7 hours!
RUNESCAPE.
Roleplay Doctor-Patient
Kiss Chase
wear crazy clothes
Make stuff all day
#LBOB
Play with my barbies
PULL FACES AT PEOPLE
LEGOLAND
Sit in a muddy puddle
EXPLORING
Rude words in Dictionary
POO STICKS
Get accepted socially for being small
Make mud cakes
CHAT ROULETTE.
Make mud pies
same
hold my best friends hand with no judgement!
Nack
Run
BURN THINGS.
PLAY MUD.
EXPLORE NATURE.
Play with my imaginary pets... and not be judged.
Hang out with my friends
EXPLORE THE UNIVERSE
666
FINGER PAINTING
MAKE A FORT FROM STICKS
Kiss everybody I want
ORGANISED VIOLENCE. (AKA RUGBY)
Build a den.
Be a Queen
打麻将
WEAR MY PYJAMAS ALL DAY.
Trump
Dude so cool!

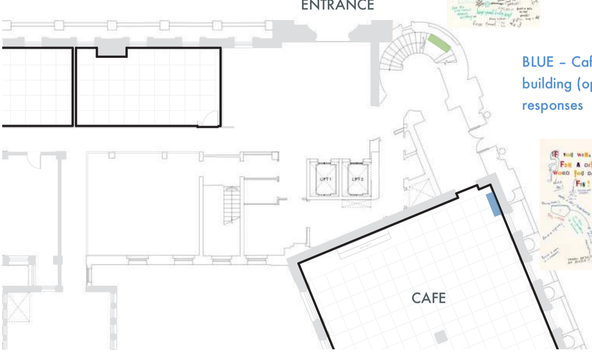




RED - Corridor to P.D and MA (slightly secluded): 30 Resposes

CONTEXT
LOCATION

GREEN/BLACK – Stairway to all studios (busy): 55 responses



BLUE – Cafeteria in faculty building (open to public): 15 responses

I've initially split the answers to my question into 5 categories; humour/show off, political, social, judgment free imagination and creation
Dr. Stuart Brown backs three of these categories as types of play, social play and imaginative play (judgment free) and object play (creative). The categories are explained further below:

1. IMAGINATIVE & PRETEND PLAY
Play type - "Whether it's done in a group or on one's own, imaginative and pretend play is the birthplace of creativity. Whether a child is playing house or hosting a tea party, he or she is developing their own inner story and an understanding of his or her place in the world."
(Rainbow play systems, 2015)

+
STORY-TELLING NARRATIVE PLAY
"Storybook telling/ Netflix"
(Rainbow play systems, 2016)
Play personality – THE STORYTELLER
"Imagination is the key to the kingdom of play...they can bring play to almost any activity" (Stuart Brown, 2009)

2. CREATIVE PLAY
Creating music idea generation
(Rainbow play systems, 2016)

+
OBJECT PLAY
Toys, developing problem-solving skills
(Rainbow play systems, 2016)

Play personality – "For the artist/ creator, joy is found in making things... Matisse experimented with many different forms of fine art in his career"
(Stuart Brown, 2009)

3. SOCIAL PLAY
Group/interpersonal skills
(Rainbow play systems, 2016)

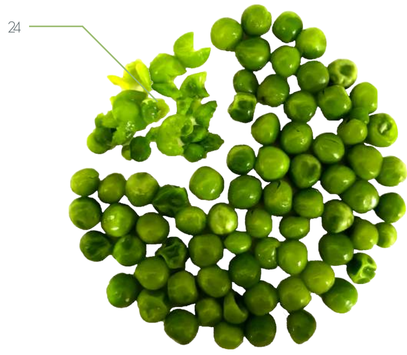
Play personality – THE EXPLORER
"Each of us started our life by exploring the world around us. Some people never loose their enthusiasm for it... Searching for a new feeling or deepening of the familiar, through music, movement, flirtation."
(Stuart Brown, 2009)

ANALYSIS

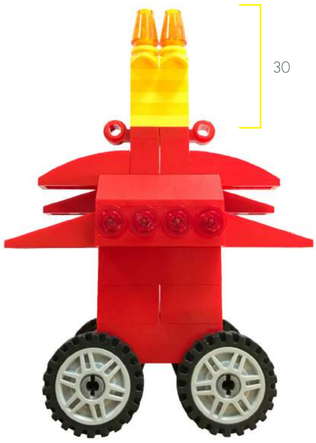
I had a total of 100 answers to the posters, this makes the percentages pretty easy!
I've illustrated the proportions of answers given below (I've chosen not to create an infographic for the humour/show off category as some of the answers aren't beneficial to the project - see below)

HUMOUR/SHOW OFF example answers:
Draw Dicks
Smoke green

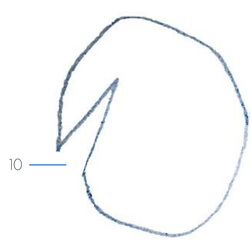
SOCIAL example answers:
Have a food fight
Smile at people
Hang out with my friends



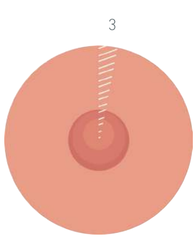
CREATION example answers:
Lego
Go to the beach, build a sand castle
Build a den in the woods



JUDGMENT FREE example answers:
Be able to draw badly and know its good no matter how it looks!
Hold my best friends hand with no judgment
Play with my imaginary pets and not be judged



POLITICAL example answers:
#freethenipple
Kill trump (+1)
Kiss any body, one love



EXHIBITIONS ON PLAY

SOCIAL PLAY

IMG.10

THE SWINGS

"The interactive installation consists of a series of musical swings. When used all together, the swings compose a musical piece in which certain melodies emerge only through cooperation. It's a game where from the start you need to adjust to the actions of others." (DailyTousLesJours, 2014)

The swings give a sense of public ownership, said to be used in urban spaces, festivals and special events. The piece was devised from an idea of unity, working as a collective in order to create rather than being individual. They have effectively democratised and simplified the act of making music, music can bring people together so easily.


IMG.11

THE BEACH

"The Beach is an interactive installation designed by Snarkitecture. Taking cues from the familiar experience of a summer day at the beach, the installation reimagines both the natural and cultural elements of the beach to create an unexpected and memorable experience. The installation utilizes everyday materials, including scaffolding, paneling, and mirrors to create an enclosure with a sloped floor that leads to an ocean of over 1,000,000 recyclable, antimicrobial plastic balls. The Beach welcomes visitors of all ages to explore, play and relax in an immersive and extraordinary setting."
(Snarkitecture, 2015)

"I make art which on could say has no purpose, and a lot of the things that we make in Snarkitecture have a function or a specific purpose. The ideas are simple and strong. For me it's a lot about reduction so often taking things away rather than adding them. We often, will make one statement, one gesture within a space and allow that to define it. "
"we spend a lot of time trying to create thse environments that are outside of your everyday"
(Daniel Arsham, 2015)

The simplicity of the beach installation allows the user to become the colourful aspect of the installation. Not only do you get to play but your surrounded by people playing, both are massive contributors to the relaxed atmosphere needed for play.
Another reason I feel The Beach is successful as a play signal is its appeal to the social media wants of an everyday person. Having fun in such an Instagram friendly aesthetic environment maybe nudges people to jump into the pit in search of 'Facebook likes'. This is a tool to be used to nudge users into having fun.

"The interactive part is awesome, because a lot of the time you cant touch the art. You can be in the art"

"I'm really not deep into art but this, you cant help but get because your immersed in it"

ADULT BOUCY CASTLE

Candy Crush launch an adult bouncy castle as a PR stunt on London's Southbank... annoyingly commercial but a great installation too. (Telegraph, 2016)

"But why shouldn't we have some fun too? Why shouldn't adults be allowed to act like children once in a while?"

"My 11-year old daughter would be incredibly jealous"

"Wouldn't they just make the world a happier place?" says Lee Simpson

"If you could pop out for a cathartic bound around after a bad morning at the office, or bounce away your Monday blues, wouldn't everyone be happier?"


IMG.12

AYA HUSNI BEY

Aya (left) is a play specialist I've come across through various articles on adult play. She used the medium of play to connect with people and in turn resolve issues. I've managed to arrange a phone interview with her!
"Counselling with Aya is a whole new adventure. It's playful and thoughtful, it moves you into a whole new space." – Henrietta Campbell (Creativityunmasked, 2017)

INTERVIEW

Elliot - What are the main benefits of play?

Aya – "The context is huge, started in 2004 with social gatherings like festivals, this acts as an immersive theater almost as people dress up."

"Even children are overwhelmed when you give them free reign"

Elliot - Do you think if we played more from day to day we would experience benefits?

Aya - "Without a doubt"

Elliot - As adults we tend to stick to social rules, how do you begin to free someone of their inhibitions with regard to play?

Aya - "you have to be relax, almost venerable to play, you need a safe space"

Elliot - What the first step in kickstarting play in your counseling sessions?

Aya - "They share their story and that inspires me to say – would you like to try painting or drumming?"
"Getting them to be dynamic"

Elliot - Do you think we see enough adult play in our day-to-day lives? And why?

Aya - "Absolutely not. The way we are going is detrimental to adults and in turn children"
"There's so much to fear in the world today, pay the bills, mortgage, single parents don't have time"

Aya - "In Europe they have squares, where people of all ages hang out with each other. I have a friend who came over from Australia and she said there are so few places to sit outside so maybe its to do with the weather?"

Elliot - What are the common playful acts you encourage people to do in their everyday? (for example commuting to work, public places)

Aya - "Adult play promotion companies
Bearded Kittens
Copper Dollar
Youmebumbumtrain"
"There's one thing that youmebumbumtrain did where one person in underpants gets on a tube at each stop to give a certain commuter a laugh"

A lack of creative outlets for people seems to be an issue and the idea of 'I can't paint' too. Generally Aya thinks people don't seem to try fun activities unless they feel they can exceed at them, "evaluating is detrimental to play" she notes.
"Changing the mindset is more important than anything else" Aya believes and I agree. Her work involves one to one contact in order to achieve this ability to play in flow, with no care for evaluating the result. I aim to use my design skills to get more adults to play, causing people to realise play is something only achieved when you stop caring is going to be extremely difficult.
(Aya Husni Bey, 2017)

From the interview I think it's clear to see that Aya sees an issue with adults attitude to daily play, seeing it as inefficient for society. My research thus far and the phycology books I'm reading however demonstrate a benefit.

Getting adults to openly play in a public space will help spread the behavior. By offering adults a time to play throughout their day-to-day routine eventually the attitude to play will change. It will become more accepted to see adults play in the long run if opportunities to play are seen as invitations.

ADULTS AND PLAY

Charlie Todd, comedian, improvisation actor, creator of Improv Everywhere feels, “you know, as kids, we're taught to play. And we're never given a reason why we should play. It's just acceptable that play is a good thing.” (Charlie Todd, 2011)

But “the thing that’s unique about our whole species is that were designed to play throughout our whole lifetime” (Dr. Stuart Brown, 2008)

Our ideas about what play is change as we grow up. Xbox games, football “watching sport, sitcoms, Oprah, or an excellent drama on TV is usually a type of play… Think about how you feel walking out of a really good movie, bringing your mind back again to the everyday world but retaining a changed perspective. One critic remembers walking out of Laurence of Arabia and feeling that the sunlight looked different.” (Stuart Brown, M.D with Christopher Vaughan, 2009)

Movies are an undeniably successful way to play, listening to a story and imagining. But I miss the childhood activities – for example, why isn’t there a playground for me now? An everyday play that I don’t have to pay for…

“Official figures show that productivity has barely increased since 2006 and that the UK has the lowest rate of growth in the G7.” (Phillip Inman, 2016) I think if we play more it can benefit all other aspects of society.

However “Your own personal play history is unique” (Dr. Stuart Brown, 2008) and your current acceptable form of play is different from one adult to the next.

How can I connect individuals through play?

“The work that we find most fulfilling is almost always a recreation and extension of youthful play.” (Stuart Brown, M.D with Christopher Vaughan, 2009)

The poster research demonstrates how comfortable and ready everyone was to reminisce about his or her childhood play, could I use this, as a catalyst to subconsciously tell adults that play is not only ok but also beneficial?

REFINED RESEARCH AND DESIGN

PUBLIC SOCIAL PLAY

IMG.14

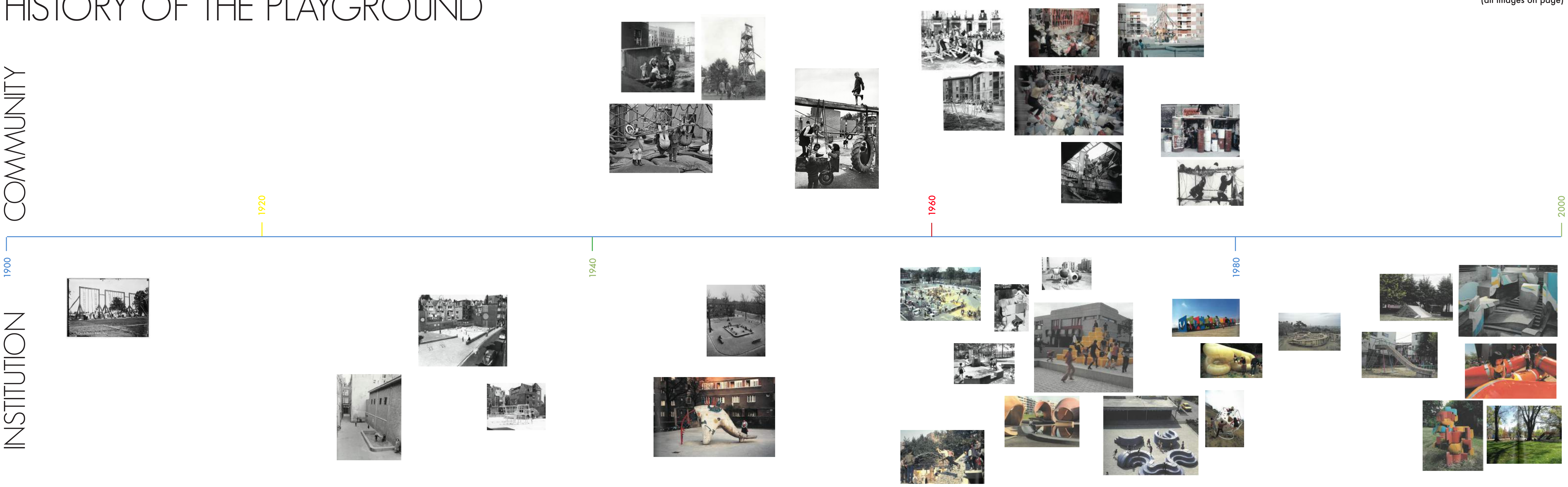
IMG.15

"Belgian artist Carsten Höller has filled the Hayward Gallery and terraces on London's South Bank with interactive installations, including a pair of spiral slides." (Dezeen,2015)

But why does play always have to be objectified? Put in a box to interact with, within the norms of an exhibition or installation? People play throughout their adult life, that's undeniable but we don't play in our everyday. Our everyday is public, for public, because we enjoy it, efficiency is always the focus. Why aren't there any trampoline bridges, restrained to a concept aimed for publicity? Why can you choose to slide down to the bottom floor instead of taking the stairs? Its inefficient but why cant we be efficient in fun?

HISTORY OF THE PLAYGROUND

IMG.16
(all images on page)



THE PLAYGROUND PROJECT
(Gabriela Burkhalter, Kunsthalle Zurich, 2016)

Playgrounds rise and fall in society
This history is extracted from the book The Playground Project, written by the city planner Gabriela Burkhalter who has researched urban planning for several years.

Her foreword is worth mentioning and is paraphrased below:
"But why is no one interested in playgrounds? One possible reason is that you cannot build a successful career by designing a playground"
(G. Burkhalter p.7)

"Since they are neither perceived as buildings nor as landscapes, art or architecture, they have never been designated for preservation – luckily, we say, since this has allowed them to continue to change, improve, become worse, or simply disappear." (G. Burkhalter p.7)

Playgrounds are " a cause of conflict between innovative and established perspectives, and something for both adults and children to project their desires onto – in short, playgrounds are site of subversive potential"
(G. Burkhalter p.13)

1900

1920

1940

1960

1980

2000

1869 - 1950
Social reform was the main driver for playgrounds in the early days "as child labour began to be regulated at the beginning of the 20th century, the issue of what children should do with their free time grew more and more urgent." (G. Burkhalter p.14) The American playground movement had begun in Boston, inspired by a German model. At the time they looked like open-air gymnasiums.

In the early 20th century works on the phycology of children were published, Jean Piaget (1896-1980) convincingly demonstrated how important childhood is to becoming human.

In this period the strongest international impulses for playground came from Sweden, Denmark and Holland, before and after war. Encouraged by developments in art and architecture. The idea of social reform now turned into one of how free play is integral to children's development.

The first breakthrough in creative social play was the skrammellegeplads, (sand pits) Hans Dragehjelm first conceived these from the idea that" Sand, the greatest teacher... spurs the playing child to generate idea after idea."
The playground idea then began to replicate itself through central Europe, ideas progressed early on but were halted by the 1st and 2nd World Wars.
(G. Burkhalter p.14)

Case example:
"The economic crisis of the 1930s created a demand for new, cost effective concepts instead of supervised spaces" this drove the sand pit, minimal tubular steel playgrounds of the 1930-40s section. These structured examples were made by Aldo van Eyck.
(G. Burkhalter p.14)

1950 - 1980
"Only in the 1960s did artists begin to experiment in public space, break through outdated ideas, and explore the pleasures of reckless play."
(G. Burkhalter p.20)

"New concepts of play that were anti-authoritarian and anti-institutional had to be tested"
(G. Burkhalter p.20)

A DIY movement in the USA provoked community lead democratic creation of playgrounds. In this period 'to raise a barn' described the kind of community action that was underway creating playgrounds.
An example of this was the "Playground for Free program, started by the state of Pennsylvania, making numerous playgrounds out of recycled materials."
(G. Burkhalter p.26)

Whilst in Europe an economic boom saw artists create playground spaces within the rapid development of housing post war. Function was generally replaced with provoking creativity as a means of play.

1980 +
"The beginning of the 1980s...marked a fundamental change. Alongside a growing aversion to risk, privatization and commercialization were on the increase." Safety requirements killed it basically, a set of Eurocodes for playgrounds. Unsupervised play began to be seen as irresponsible parenting. "At the same time, as pressure on children to perform well in school has grown, their daily schedules have been filled with activities."
(G. Burkhalter p.31+32)

PLAYGROUND FOR KIDS, AND ADULTS. . . ?

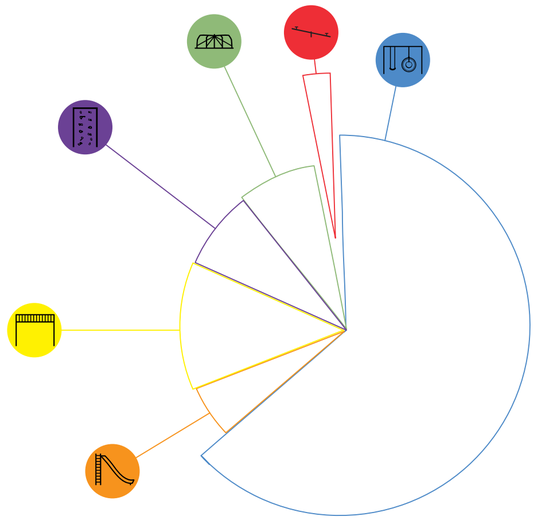
On a visit to the exhibition 'The Playground Project' I was mega disappointed at the amount of kids having fun on the Playground... Not because I'm mean but because I felt I couldn't join them on the apparatus without getting in their way. Maybe this was my inhibition or there could be a better way for adults to play?

IF THERE WAS A PLAYGROUND INTENDED FOR ADULTS WOULD YOU USE IT?

YES

97%

WHAT'S THE MOST FUN APPARATUS IN THE PLAYGROUND?



WHY?

Climbing wall:
Challenging
Most difficult/challenging
More than other apparatus, you can be creative

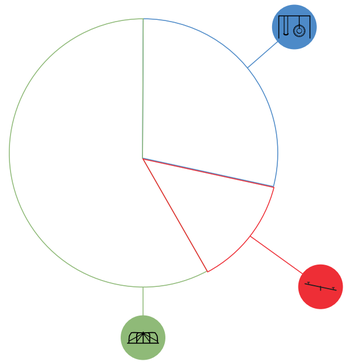
Swings:
To see how high you can swing
You can do it in pairs
Relaxing
Loved the speed and the felling of swinging backwards and forwards
It requires minimum effort to have the most amount of fun
Minimal work for an excellent feeling!
Freedom
The motion
Its like you can fly
Fastest without spinning
Speed
Because you can do it your own way at your own pace
Because your in the air
Not as restricted as the others
Unique feeling
See how high you can go and jump off
Beautifully relaxing, but maintains an optimal level of unrivalled excitement
It was always the most desired item when you went with friends and everyone would rush to them, maybe thats what made it more fun the fact that it was a race to get to them? Also swings... duh
Competitive
The motion of it feels like flying and it's addictive so you just want to keep going and going on it
Because you get a seat
Challenging, especially moving monkey bars (on chains)

Slide:
Its more like a rise than a slide.
Because you can go fast and I generally like being high up and being able to see from a different vantage point - like you're somebody else or in a different world

Monkey bars:
Good exercise
Because I like the weightless feeling
Something exciting about being upside down for a split second
Challenging (very jealous when my sisters could do it before me)

Roundabout:
Trip out whilst being dizzy
Because it spins fast and makes the kids laugh

WHICH IS BEST FOR PLAYING ON WITH FREINDS?



DAY AT THE PLAYGROUND

Spending an hour or so at a local playground in Endcliffe park with 5 peers as a method of research...best research imaginable, uncovered a lot ethnographically. The playground apparatus are all designed for social interaction, potentially as a means for child development each piece is a way to experience joy with one or more people.
From earlier surveys it was clear that social explorative play was most popular so this small day of research has further reinforced that play apparatus is a social play benefit.
It's completely evangelical to imagine that playgrounds for adults will be springing up any time soon but I noticed a small glimmer of hope in the UK governments planning policy:

"Development is about far more than just building homes. Communities need roads, rail links, schools, shops, GP surgeries, parks, playgrounds and a sustainable natural environment. Without the right infrastructure, no new community will thrive – and no existing community will welcome new housing if it places further strain on already stretched local resources." (Gov.uk, 2017)

The document details that play is regarded as a building block for communities. This could help fight against the decline of readily available Playgrounds for both children and adults.

It's clear from my questionnaire that my target market, adults, want to play more. The survey indicates that the market interested in play equipment is huge. A wide range of ages completed the survey from 20year old to 66 year olds. All had ranging job roles.

Playground equipment for adults is an exploratory area for society its subsequently unexplored in design.

Playgrounds are routed in European and British culture, from my research it's notable that communities can be driven enough to create their own play-scapes. But how can society bypass, or work with, regulatory standards of recent years to keep play safe but also accessible?

Open source design could be one answer to this. Or at least its worth getting to know the community, as its seems a promising avenue for making play for accessible.

"Play is addictive because it offers the potential for a different result each time we engage"(Steve Johnson, 2016) This design won't solve a problem but act as a step in liberating play for adults.

COMMUNITY PLAY

IMG.17

IMG.18

OPEN SOURCE PLAY

“Humans vs. Zombies is a game of tag played at schools, camps,neighborhoods, libraries, and conventions around the world.
Human players must remain vigilant and defend themselves with socks and dart blasters to avoid being tagged by a growing zombie horde.” (humansvszombies.org, 2017)

"It's free, you know. And it's freeing, too. Phenomenally freeing. You don't have to be a kid to play. You don't have to be in elementary school or high school or college even. Call it team building. Call it community building. Play in the park, in the playground, in a corporate plaza, a senior center, in an office building, in hospital corridors, in the neighborhood. It transforms the world. It's awesome fun." (Bernie DeKoven)

‘Its infectious’ not just within the game, seeing people come together to play is spreading the humans vs zombies play is the general consensus of users. The simplicity of the game and it being played in public are both main contributing factors to its spread of play. This backs up my idea of bringing play to the everday.

OPEN SOURCE DESIGN

M. Dexter cites Torrone (2012), the 'Unspoken Rules of Open Source Hardware'

The 'Unspoken Rules of Open Source Hardware' are:

1. We pay each other royalties, even though we don't need to.
2. We credit each other, a lot.
3. Naming: be different. It's better to be unique.
4. We actually do open source hardware.
5. Basing your project/product of open source? Open source it.
6. Code and designs: add value.
7. Cloning ain't cool.
8. Support your customers.
9. Build your business around open source hardware.
10. Respect the designer's wishes.
11. When we finally get an open source hardware foundation, we'll all support it.

MATT DEXTER TALK

Dr. Matt Dexter – PhD in open source design
Below I have paraphrased his comments during a conversation in the studio.

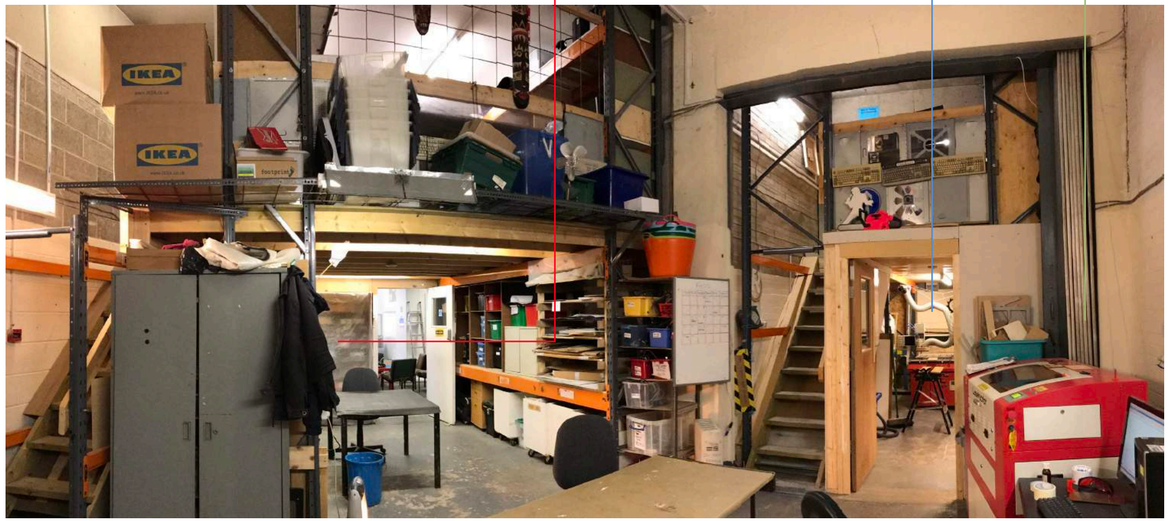
"Open source design is community driven not business driven" – Ill have to inspire a number of designer makers/small businesses/adults that it's a good idea to install play equipment in their local area. Alongside this not many makers actually make your designs, they alter and hack them therefore expanding the range.

I should be using the open source community as a driver for the spread of play. By defining the tools, places and interactions I could create a community for play.

ACSESS SPACE

These Sheffield based open source community spaces are where I'm looking to find people who could be excited by adult playgrounds, in Access Space they run workshop aimed at fixing obsolete products, fabrication for artists and performance art.
Artists and makers use the facilities for projects and they are part of a wider community called Pixelache Network (also an annual open source festival) so there is potential to get involved with what they're doing.

Laser cutter



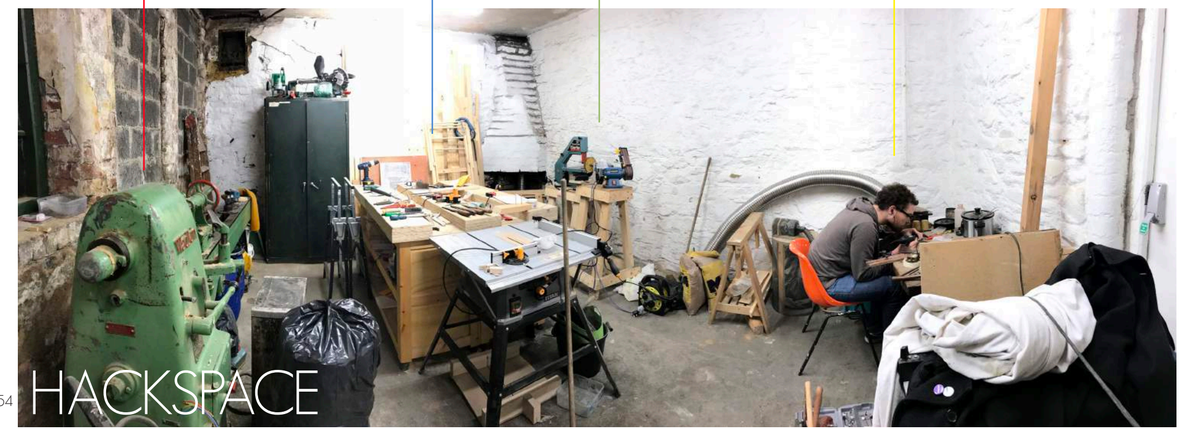
These disk and belt sanders were also ‘donated’ to the Sheffield Hackspace.

This lathe was ‘donated’ to the Sheffield Hackspace , Its actually just being stored in the space and the Hackers are secretly using it.

This skilled silversmith is part of a much wider European open source community. I’ve encountered lots of enthusiastic people in these open source spaces and heard a lot about how they founded what they do:

The first members of these open source communities find a space and ‘hack’it, by building up their infrastructure and machines through scrimpy but slightly ingenious methods. And they do it for the pure enjoyment of hacking, its adult play in a way.

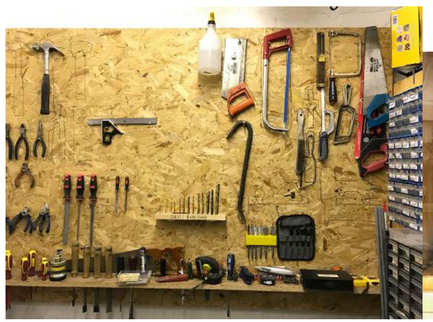
One member said in conversation “I’ve never seen so much helping of people.” I think this goes to show how community driven open source design is, like Matt Dexter mentioned. This hackspace, alongside Acess Space Sheffield (shown to the left) aim to up-skill their members, these communities don’t trade – they help and develop each other as a means of progression.

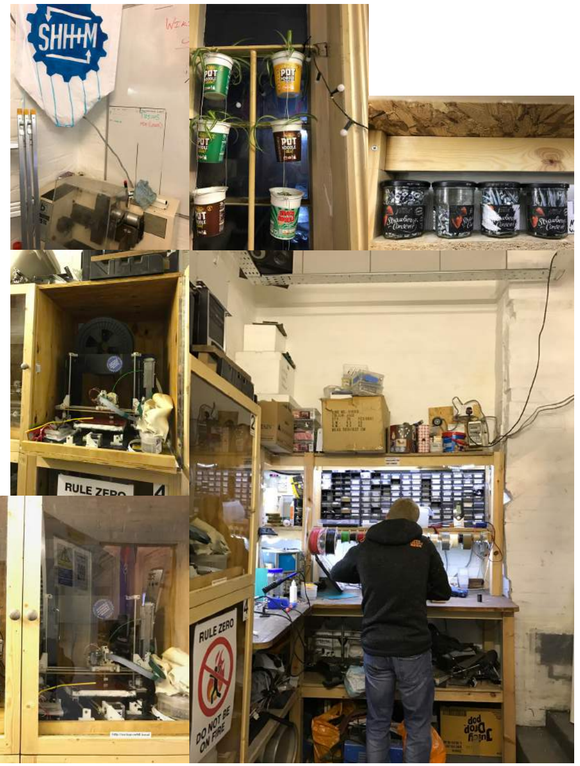


HACKSPACE

QUIRKY

Electronics are the main food for thought in Sheffield Hackspace and 3D printing. Some project example include Wi-Fi router fixes, encryption algorithms for home security systems and the construction of Makerbot /open source 3D printers. They do a pledge drive once voting on a new piece of machinery to acquire. There system is subscription lead, for heating rent ect. Their enjoyment for finding open source solutions is clear in the spaces make up. Everything is either recycled or reclaimed, designed bespoke by a member for the space. The users don’t seem like they would be interesting in hacking/developing the playground furniture I’m aiming to create. So accessing some more designer maker open source community is what ill do next.





Danger of play

TUTORIAL 4

Can it be open source?

It looks unlikley... :(

The manufacturing possibilities for open products are not suited to a structural issue such as a playground.
With CNC routing (wood) laser cutting and 3d printing plastic (ABS usually) as the main available processes a playground is an engineering nightmare but further research needs to be done.

Can it be guerilla? Can users make and install the apparatus in the public realm?

Without mass public support, not right now, no.

Its too utopian to think that an adults playground could be in the public realm straight away. Installing an opensource slide in the council city center space inevitably costs too much (for it to potentially ripped out the next day). This outweighs the possible benefits for that single day.

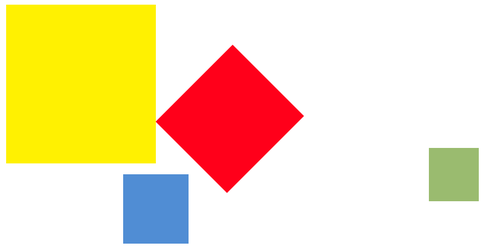
What's the solution?

To spread adult play I need to start at a grass roots level. This means installing play apparatus in areas that there currently is not. Small businesses that want to adapt the Google office style of play currently don't have a cost effectively way of doing so.
I will design play apparatus, instructions, tools that enable small businesses, church groups, artist designer communities and private land owners such as cafes the ability to build to create and build an adult playground or part of it.

This will hopefully kick start awareness of adult play. There's potential for this to run alongside a swings project, in which I will design an adaptable fixing for an adults swing which can be installed anywhere in the city.

But for now I will focus on developing open source, cheap, playground apparatus.

USER GROUP



CREATIVE BUSINESS

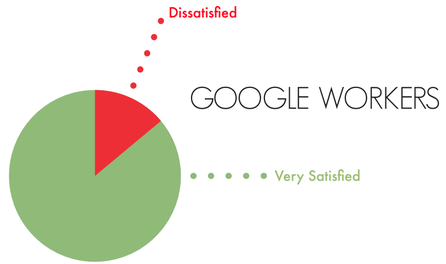
The managing director of Google UK has the opinion that “forward-thinking firms, Mr Cobley told his audience, ought to nurture serendipitous interaction between their staff.” (Independent, 2013)
Also, “the office of almost any modern tech company is littered with break-out spaces and brainstorming pods. Google’s London base has a roof garden featuring allotments that staff can apply to maintain.” (Independent, 2013)

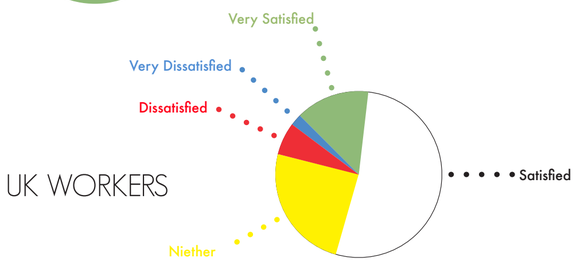
Google even employs a chief happiness officer whose sole job is to keep employees happy and maintain productivity!

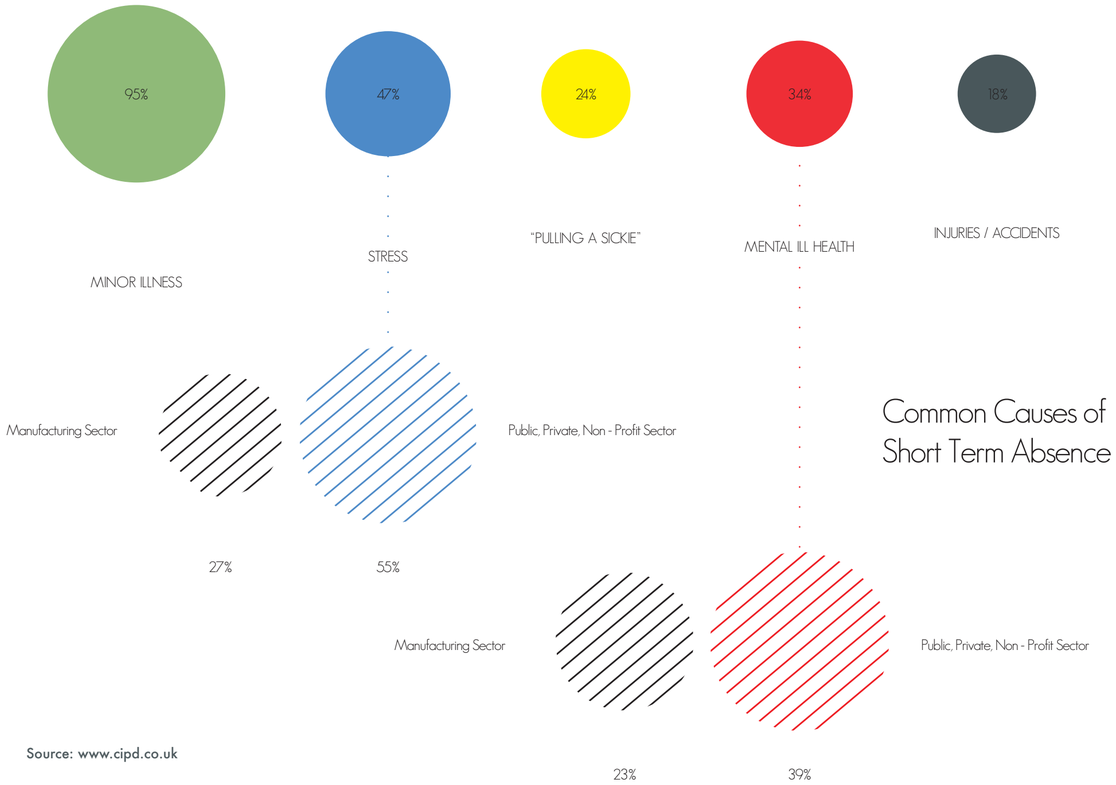
Businesses are adopting the Google office approach as World Economic Forum, The Energy Project and Harvard Business Review, HRMagazine states:

-Employees in companies that support healthy habits are eight times more dedicated, and three-and-a-half times more creative and innovative.
-Leaving the office and interacting with your colleagues boosts creativity and engagement.

Wellbeing is vital to a businesses success.







Source: www.cipd.co.uk

Common Causes of Short Term Absence

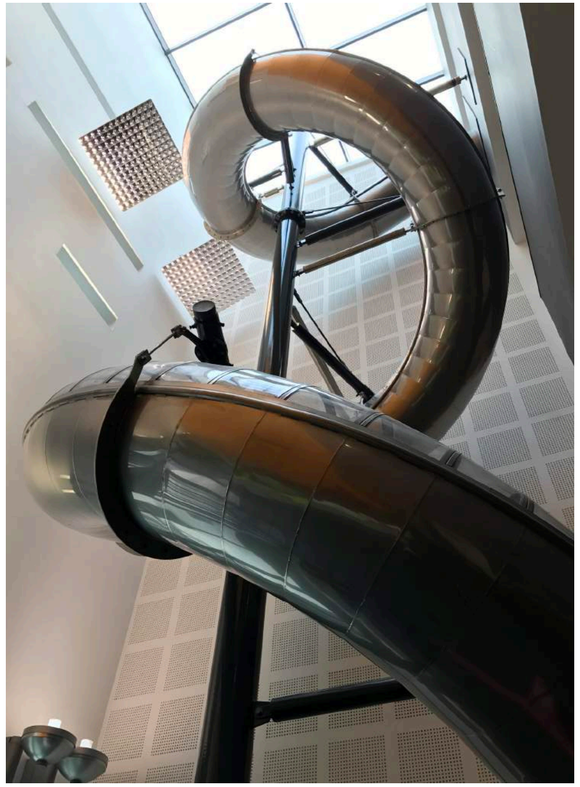
After reading CIPD's analysis report on 'workplace absence causes' its clear that an adult playground would help those working office jobs most."Looking forward, slightly more organisations anticipate an increase in well-being spend in 2017 (46%)."(CIPD, 2016) This indicates a surge in spending aimed at making the workplace more enjoyable.

The manufacturing and production industry suffer less from Stress and Mental ill health. As an adult playground would aim to improve the mental wellbeing of its users my key market will be creative workspaces. Other markets include open source festivals, community events and home users.

The creative workspace involves many kinds of people. From personal experience it attracts extroverts, curious kinds of people.

Paula Scher is one of these. As a successful graphic designer, she is a forbearer for creatives and some of their attitudes. Paula heroes serious design over solomn design, "serious design, serious play, is something else. For one thing, it often happens spontaneously, intuitively, accidentally or incidentally." She goes on to say "That's because the art of serious play is about invention, change, rebellion – not perfection." (Paula Scher, 2008)

Creativity and play are inherently linked, that's nothing new but it does tell me that the most applicable market for the seesaws is the creative workspace.
She talks about how ignorance to the rules forces designers into play, the act of learning in novelty causes us to design in a play state. The seesaws are a novel experience for most adults, having likely not visited a playground for years, so hopefully they can aid creativity in the workspace.



ELECTRIC WORKS VISIT (SLIDE)

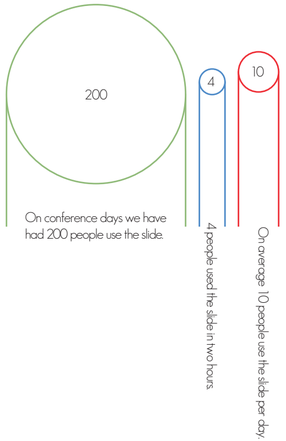
I've emailed ahead to ask if I could visit a local Sheffield creative business hub. Electric works is a well eastblished organization, "We house many creative digital and tech companies and feel that the slide is a great statement about the business that goes on here at electric works." (Jessica, 2017)

"Really it is just for fun, and was implemented to brighten up the working day for our tenants. It is used every day. Especially when we have conferences and events on." (Jessica, 2017)

The slide is an everyday object for play. A perfect example. The process involved signing a disclosure agreement, reading the safety guidelines. Jumping into a sack and sliding to the ground floor. This means that my product could follow a similar safety procedure for the creative environment.

Some ethnographic research was also conducted, see to the right.
(Primary information gathered conducting questionnaire outside electric works and Union-St. Friday 21st of April.)

How often is the slide used to have fun? (1 Day)



Do you ever use the slide for any other reason other than fun? (ie helps you solve a problem)

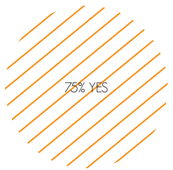
"Yes, it's a fantastic way to change up your environment."

"Its an adrenaline rush"

ELECTRIC WORKS
30 responses

Are you happy with the current facilities?

Would you use a seesaw for adults?

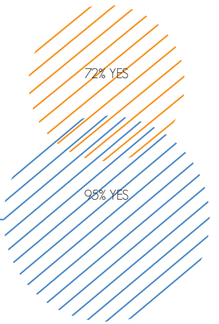


Do you think play equipment would help/improve this workspace? (Seesaws, slides and swings)

UNION - ST
20 responses

Are you happy with the current facilities?

Would you use a seesaw for adults?



INITIAL VALIDATION

The first survey conducted, asking adults “if you were a child for a day what would you do to have fun?” directed the project towards social play and playgrounds.
social

The second survey refined the idea that adults are still comfortable with the playground with 97% agreeing that if there was a playground intended for adults, they would use it.

This final survey contextualises the idea of a playground for adults in a commercial setting. The products need a route to market if they are to have an impact. Creative business at Electric Works and Union-St both feel play equipment would improve the workspace with only 5% disagreeing.

With this context in mind

If a small business wanted to buy a piece of office play equipment the go-to is a table tennis table. This is my main competitor for office play. As the Seesaw has no direct competitor, other than public installations. I will use a table tennis table as a price bracket to aim for, or undercut.

Justifying the Seesaws to businesses as a benefit to the work environment and not a distraction will need to be done through a short video or good imagery.

Donnay
Indoor table tennis table
£189.99
(not including post/packaging)
(www.amazon.com)

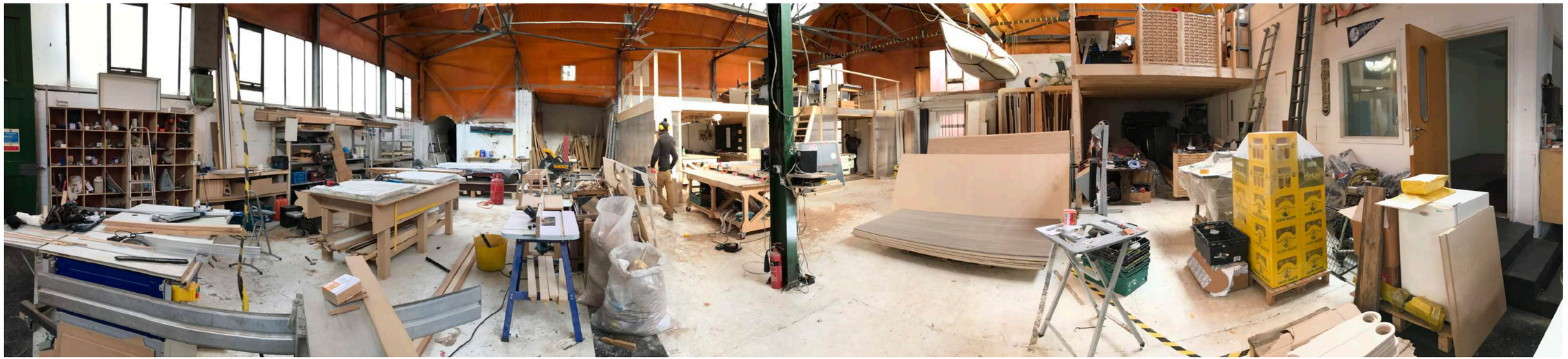
Decathlon
ARTENGO FT 730 OUTDOOR
£199.99
(not including post/packaging)
(www.decathlon.co.uk)

IMG.19

OPENDESK

“By bringing production back to your neighbourhood” through local CNC makers, “we’re creating a new kind of supply chain for beautifully crafted furniture. We spend one third of our lives working, so our work environments matter. These companies chose Opendesk designs because they’re beautiful, made on-demand and built for collaboration.” (opendesk, 2017)

CHOPSHOP SHEFFIELD



On a recent visit to a Sheffield maker, I discovered more about the opensource community and Opendesk. Sam, maker at Chopshop Sheffield, mentioned that the director of Opendesk, Joni Steiner, also created WikiHouse. This is an Opensource flatbed CNC house. He mentioned that its aim was to put the production of housing back into the hands of the consumer. This is similar to the aim of my current project, trying to make play more accessible to adults. He also detailed a lot about the Opendesk process, please see more about this on the next page.

We personally look over all the designs that we receive, and assess them based on a series of the principles we've applied to our own designs:

- How does the design fit into our current focus on workspaces?
- How efficient is the design in terms of material use?
- How easy is the design to make and assemble?
- How ready is the CAD for production?
- Has the design been previously prototyped?
- How efficient is the design in term of machining time?
- How does the design visually reflect the efficiency of its production?
(opendesk, 2017)

"Anything from desks and storage solutions to meeting & breakout space furniture ideal. If it compliments something that we already have, or adds a new function or clever capability to the workplace that's even better :)" (opendesk, 2017)

"We design for standard plywood sizes, so for efficiency it's important to fit all parts of a design onto these sheets. Fitting the parts around each other like a jigsaw is commonly referred to as nesting the parts." (opendesk, 2017)

SELECT FURNITURE

Lean Desk £1,201

38% = £456

Get quotes from local makers in your area, delivered to your inbox within 48 hours

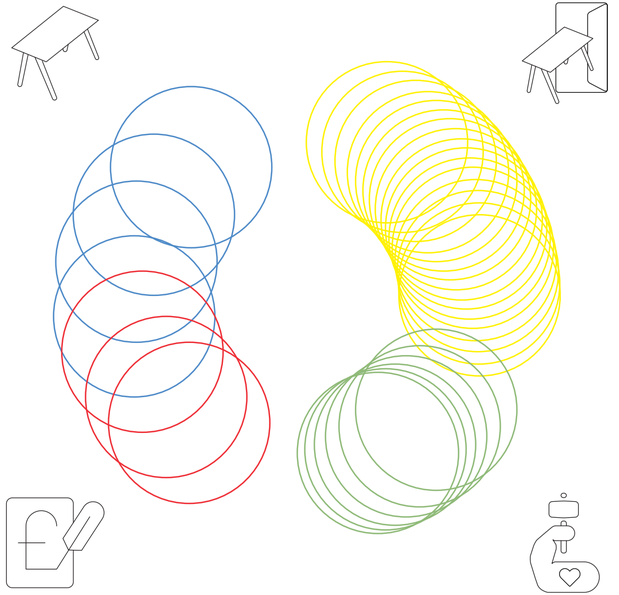
8% = £36.5

12% = £55

18% = £82

REQUEST QUOTES

"Your quote should include a 38% markup on your costs: 8% for the designer and 12% for the Opendesk platform and 18% for the sales channel (currently the Opendesk website). This fee is then collected by us and we pay the designers."(opendesk, 2017)



RECEIVE YOUR FURNITURE

"We're working with the assumption that you have your own method to safely transport your final products to your clients." (opendesk, 2017)

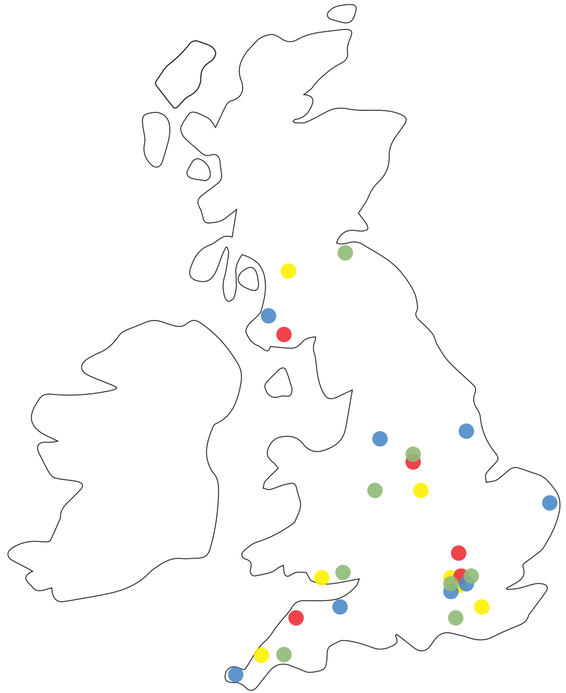
CHOOSE YOUR MAKER

"Template for assembly instructions- This is something we're working on right now – we'll share this up to everyone when it's done!"(opendesk, 2017)

"Materials are marginally flexible. This means the customer can specify if the product needs to be exterior grade or not, painted or not." (Sam Gillick, Chopshop maker)

"The price varies depending on the quality of the ply and the finish as well" (Sam Gillick, Chopshop maker)

"We do CNC, laser cutting, assembly and finishing and painting. There are also metal workers in the community. Its pretty much limitless." (Sam Gillick, Chopshop maker)



MAKERS

I'm effectively designing the seesaw as a project for Opendesk or any other furniture based opensource company. Their method of manufacture as previously discussed is suited to spreading the act of playing. To the left is an infographic that represents all the makers involved in Opendesks 'maker search engine.'

There seem to be an equal number of makers across Europe from Belgium, France and The Netherlands included in the Opendesk search engine too.

From dealing with makers on a first-hand basis its clear to see it a personal transaction. The classic product design ideal of sourcing a manufacturer is far different to this projects manufacturing process. Therefore, several safeguards for the customer must be put in place by me, the designer. Customers should be directed to Opendesks search engine to locate a nearby maker as these makers are pre-certified by Opendesk. The project is technically designed to fit into Opendesks range and would hypothetically utilise their website and supply channel.

If Opendesk were not to take on the product however safeguards will be put in place via a short booklet/PDF catalogue which will detail to the buyer dos and don'ts of the opensource world and how to find a reliable maker.

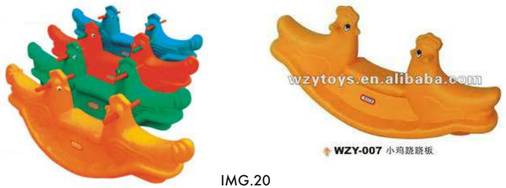
USP

Open source furniture cuts out and shipping costs of the final product. Open source also "cuts out logistical costs and reduces the markup on retail and shipping by as much as 300% – with products typically coming in 50% cheaper than other designer brands." (opendesk, 2017) Open source products also typically arrive in half the time when it comes to office furniture.

Does it save energy overall? That not all too clear but what it does do is support local designers and makers. It makes the buying process more human and helps drive local economy. This personal kind of supply chain is one that positively represents the idea of adult play, after all it would be hard to lecture about us not having enough play if I were churning out non- recyclable injection moulded seesaws.
I initially chose open source as it allows me to design play apparatus to a refined, manufactured, usable outcome. Also, the products are easily accessed by a community of makers and hackers can help drive adult play into the public realm by creating more similar play products.

But I now feel that...
There's a charm about receiving your flat pack play apparatus and building it yourself. Feeling like you active in the role of bringing play to your environment. I expect some businesses will use the assembly of the product as a team building exercise. Having bought it locally is a big USP for the creative business market. Hopefully other markets such as public spaces, cafes, courtyards of cultural quarters will feel the same.

DESIGN



IMG.20

REMEMBER THESE?!

Now banished to the depths of the Internet, only found on strange toy sales websites with poor quality images. I haven't seen one of these on the streets since I was a child.

Initial issue:
Traditional seesaws need grounding, this means concrete, time, money etcetera. The LLDPE rotational moulded seesaws for kids shown to the left were the bomb! I personally have fond memories of these seesaws but they also spur the seesaw design in a new direction. A free standing open source seesaw is possible. With the use of a curved elliptical base, a fun play apparatus that acts as rocking chair for two will define the form of the seesaw.

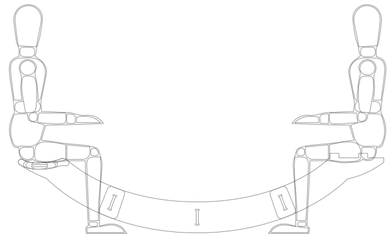
PROTOTYPE 1

Anthropometric data and testing will be key in this design. As I found with the first 10th scale model the seesaw has to allow not only for traditional human factors such as size, weight and comfort but movement too. The ergonomics of the seesaw must accommodate a typical person sitting and in mid flight/ at the peak of the seesaw.

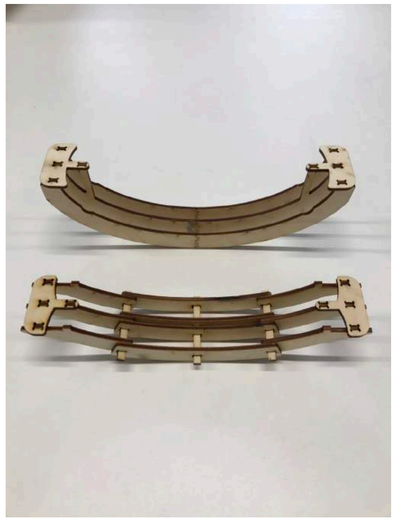
The second model is a more conservative estimate, a sitting height of 45cm results in a peak height of 85cm, this is only slightly higher than standing position for a person of around 5ft10 meaning some peoples feet wont leave the ground...

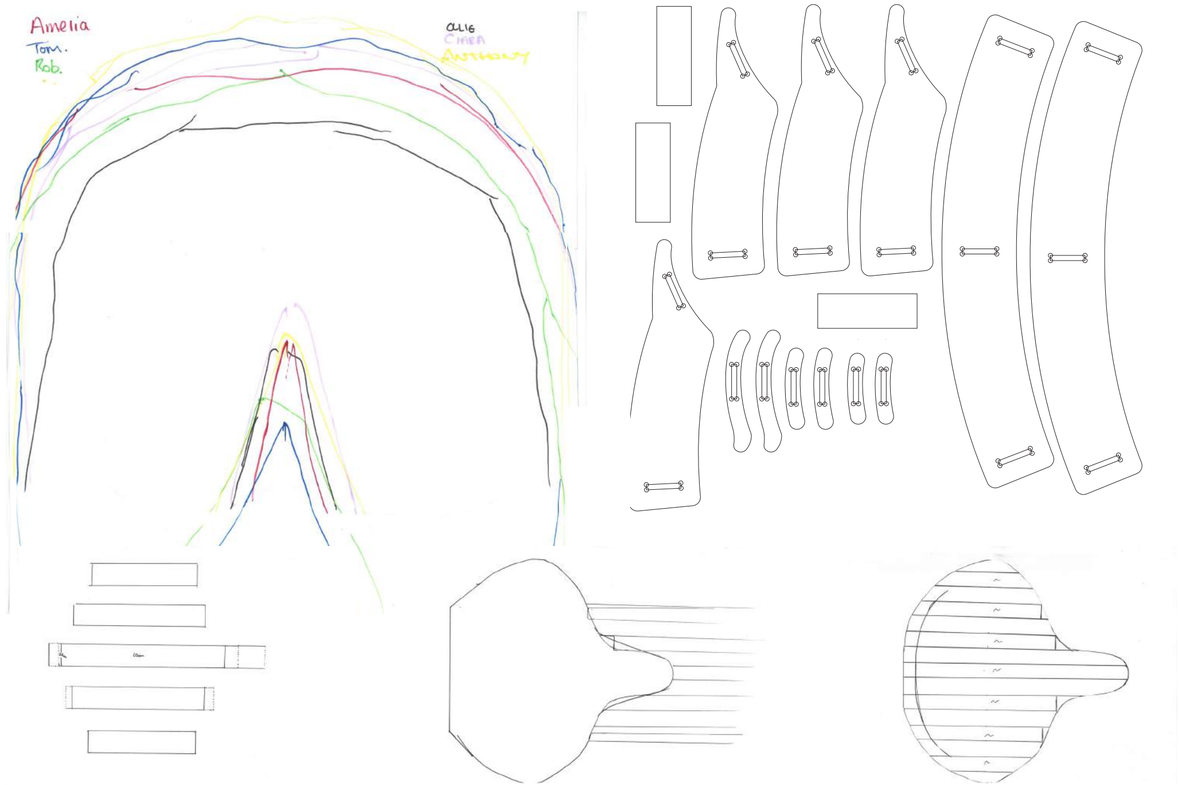
As this second 10th scale model will form the basis for the first test rig I think its wise to be cautious with peak height.

Instead of a perfect circle the curve at the base of the seesaw is a lateral ellipse. This should mean that its easiest to rock back and forth at lower heights, as the curve is least steep at the centre.



"THERE'S LOADS OF TESTING!" JOE, TECHNICIAN





TOO SIMPLE?

Initially it felt like a lot of the issues are easily resolved so I reached out Christopher Jarratt for some advice on the project. He reminded me that simplicity is usually the hardest thing to design. By giving me links to designers that place philosophies in their designs I now know that I have to encompass a message about play within my design that is simple. And I reminded myself that there's still lots left to do:

Future things to consider:
Visual interpretation of the seesaw
Semantics feeling comfortable
CNC technicalities; learning the joinery and figuring out how to fix the apparatus together with simplicity.
Using the material and process efficiently
4ftx4ft board restrictions

Email to Christpher Jarratt - colleague of Tom Tobia, expert in CNC and community deisgn (also worked on Assemble & Join project) has a special interest in encouraging imagination in adults.

Elliot's email - ...I'm working on CNC open source adult play apparatus - seesaws, swings for my Major project and plan on creating a makers handbook.
I'm emailing to see if you had any information or advice about keeping a playful mindset throughout adulthood. As I wish to convey/inspire people to create play objects through this makers handbook.
Also, advice on inspiring community action would be much appreciated...

Christopher's email - Hi Elliot,

Great to hear you are planing to get more adults get creative.

Hard and very open questions to answer.
I recommend reading some books by/about Bruno Munari, Enzo Mari, Charles & Ray Eames and not be embarrassed to keep it simple but passionate.

https://www.youtube.com/watch?v=jntZ2hk2V7I

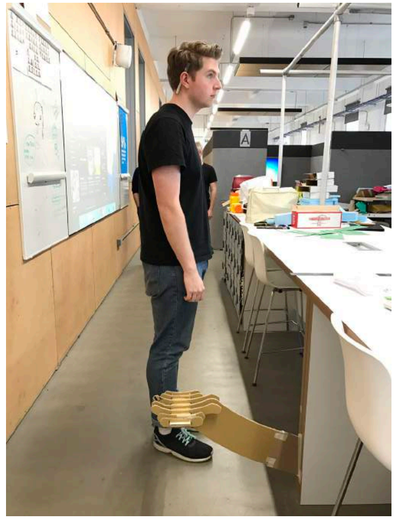
Best,
Christopher

TEST RIG

The test rig I've developed is intended to help visualize all the problems I will have with the design.
Forming the 3D object to discover all potential issues rather than pondering it through sketch work.

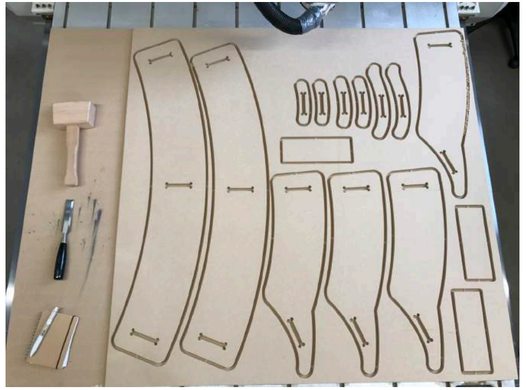
Issues to resolve:
Height.
I mocked up the seat of the seesaw in cardboard. The seat is situated at the height intended for the real version. This has told me that the seesaws overall seat height is far too low. (As demonstrated by an unusually tall course mate to the right)

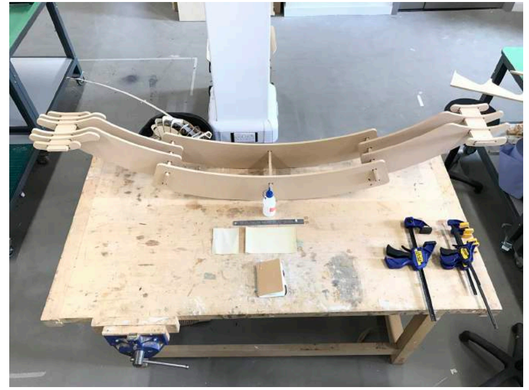
Solution
Raise the seats to a squatting height position, correct 2 dimensional anthropometric drawings, as they don't accurately reflect life size people.

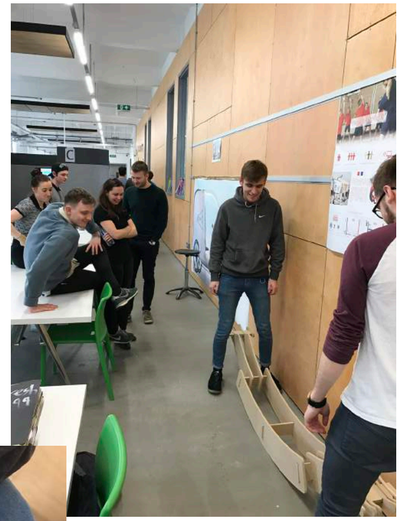


Assembly went well! The 12mm slots didn't need any micro adjustments to securely fasten the cross joining slats.
This raises the issue of wood humidity and temperature however; the method of fixing the seesaw together must be able to withstand small warping and expanding in the wood.

Counter sunk bolts should hold the seesaw in place and are a straightforward universal method of assembling the seesaw. They are liable to loosen with repeated use but they can be tightened with a spanner that I could cut from the same piece of CNC board.







Structural Weaknesses.
The weight bearing aspects of the seesaw are under immense pressure when subjected to the rocking forces of play. These forces are intensified in the weakest areas of the seesaw structure. This area has been identified as the join between seat and base.

Solution
Take the test rig to Steve, an engineer based in Sheaf Building who has helped me in the past.
Keep in contact with Joe, a technician who's worked a lot with CNC before.
Hope Opendesk respond to my email so I can send them concept drawings and gain professional external advice.

My initial thinking is to run a core of material through the seesaw.

Positive response:
As I brought the seesaw through the studio a few head turned. But it got a small audience pretty quickly. Unfortunately this test wasn't safe for everyone to try but I'm confident that I'm on the path to making something people will want to play on once I have a fully working prototype.

ENGINEERING EVALUATION

Feedback from Steve Brandon head engineering technician and CAD expert at Sheffield Hallam University.

Issue with the current design:
Flex
Buckling
Twisting

Potential solutions:
Bracing
Bridge like construction
Stepped connectors

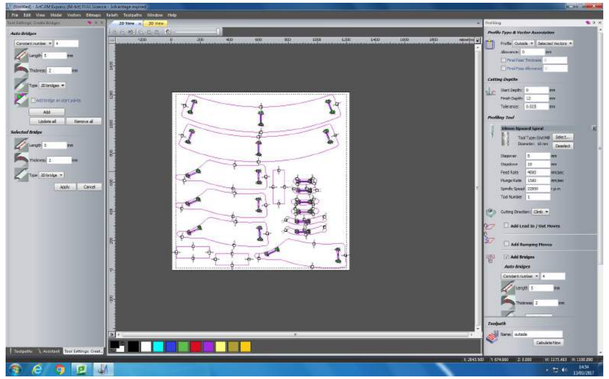
“BREAK IT! Get two big heavy men to sit on it until it breaks, this will show you where the structural weaknesses are” (Steve Brandon)

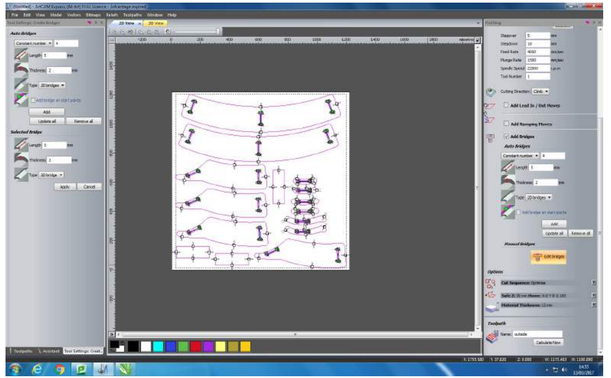
My analysis:
Steve and I chatted about the construction of bridges quite a bit...I know, great fun. However the Tyne bridge in Gateshead (where I’m from) uses a construction method which could be a useful comparable to the seesaw.

General:
Use nuts and bolts, as glue would be messy.
Keep in touch as see Steve about further prototypes.

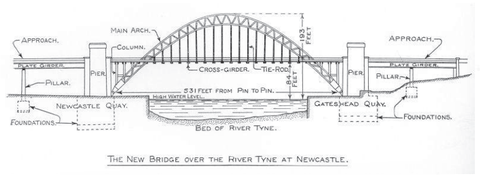
COMPLEXITY’S OF CNC

To the right are some screen shots highlighting some key stages at the setup of the CNC flatbed. Although makers will front all detailing with cutting software by getting to know the manufacturing process it’s possible to spot ways to speed it up.
A technician, Joe, in charge of the flatbed CNC lead me though some of the key stages. These being; where to place tabs, the feed rate, plunge rate and the spindle speed of the cutter.
The main point Joe mentioned was that larger tools such as a 10mm cutter will route out parts at almost any thickness – therefore being the fastest method of cutting.
The time the CNC machine is running will have an impact of cost, as making an affordable product allows it to be accessed by as many users as possible this will be kept to a minimum.
This also brought to light a broader issue about the impact the material has from an environmental point of view. Currently using MDF as a cheap alternative to plywood for the first prototype is useful but future prototypes will consider the final manufactured product to use plywood.

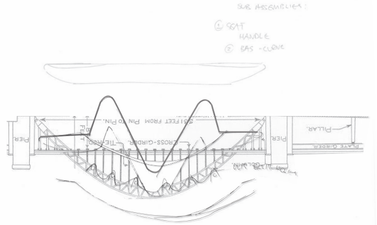


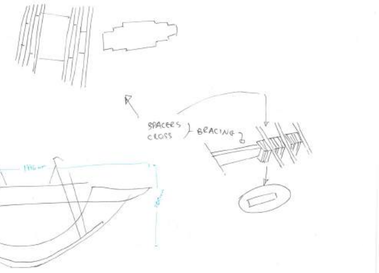


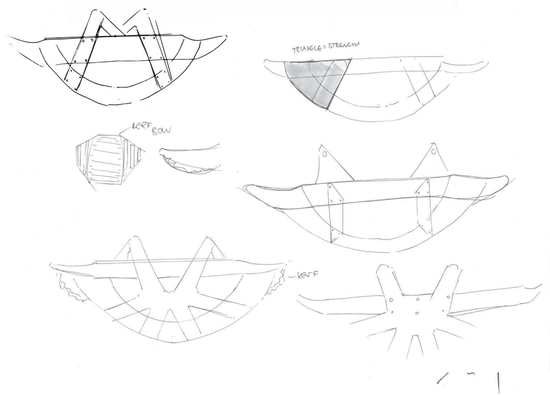
PROTOTYPE 2

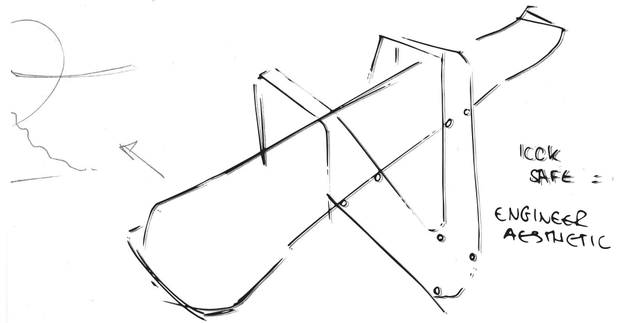


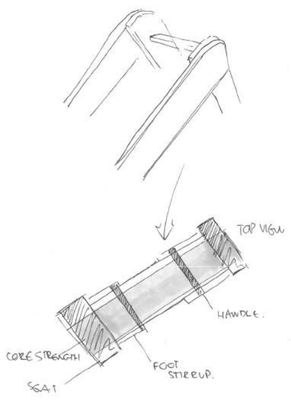
THE NEW BRIDGE OVER THE RIVER TYNE AT NEWCASTLE.

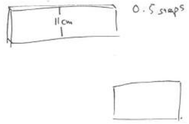


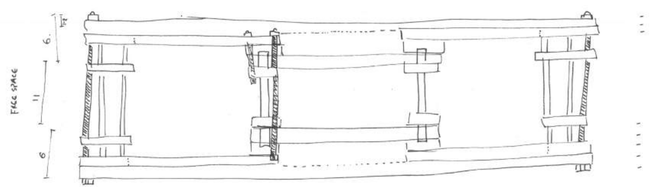


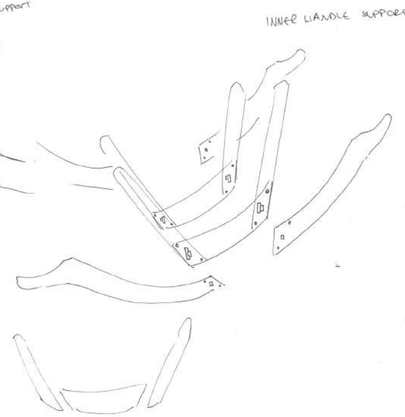


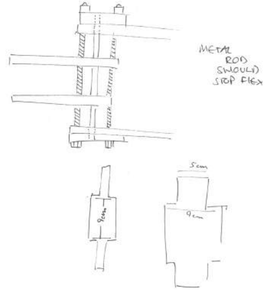




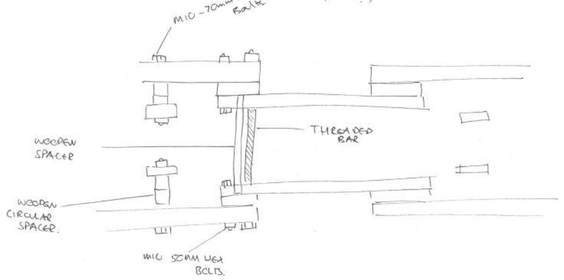


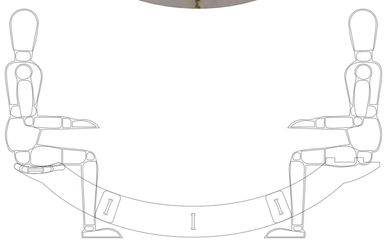






3.6 x 2 = 7.2
23
= 15.8





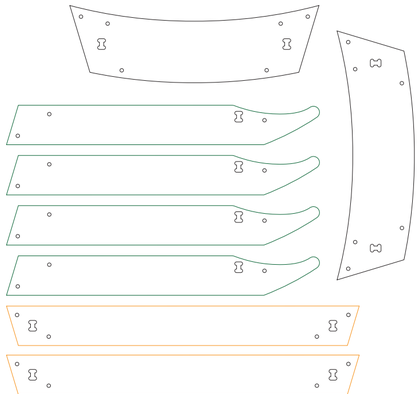
Prototype 1/2

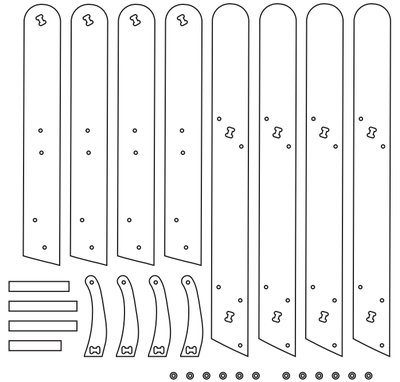
The design of the second prototype is purely driven by a need to prove the action of seesaws can be supported by a curve. Some small-scale modelling using the laser cutter has given me a preliminary idea about the geometry of the curve. The two images below demonstrate the two extremes of this testing, the design of the 2nd prototype as a middle ground between the two curves.

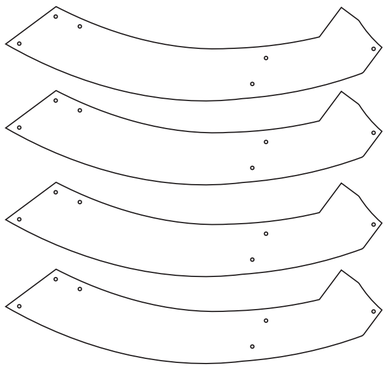
The first full scale prototype had a promising sway when rocked by hand so I have used this as a guide in the second prototype.

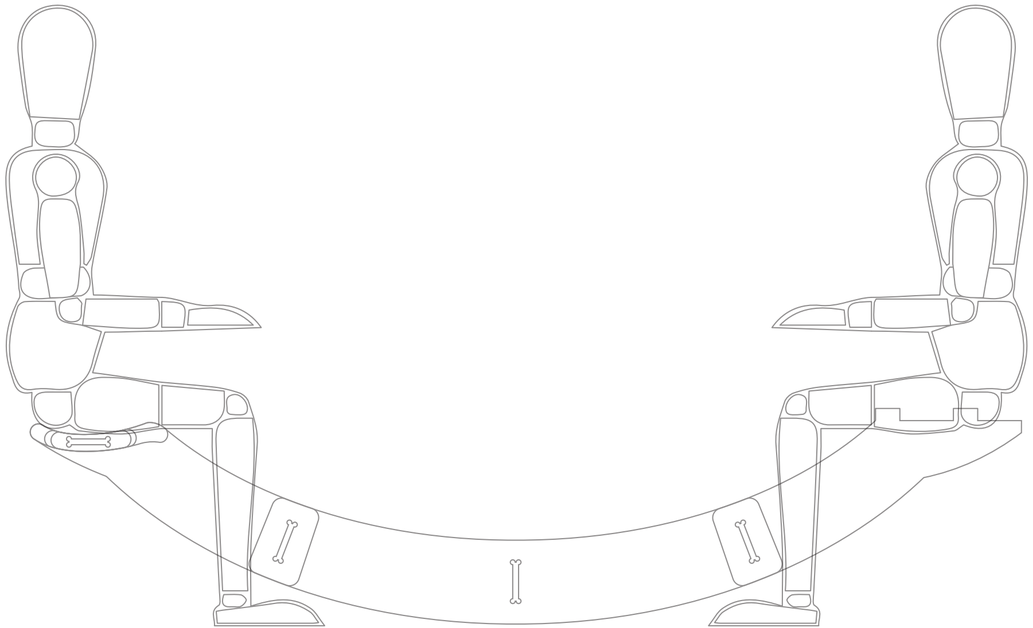
On Steve's advice (Engineering expert) I have added plenty of bracing. After looking at other structures such as the Tyne bridge in Newcastle I've opted to place these braces in a triangular formation. This, I hope, will lock the most stressed parts of the seesaw in a solid structure. This triangular shape has also allowed me to place a handle for the user in a comfortable position without just adding one.

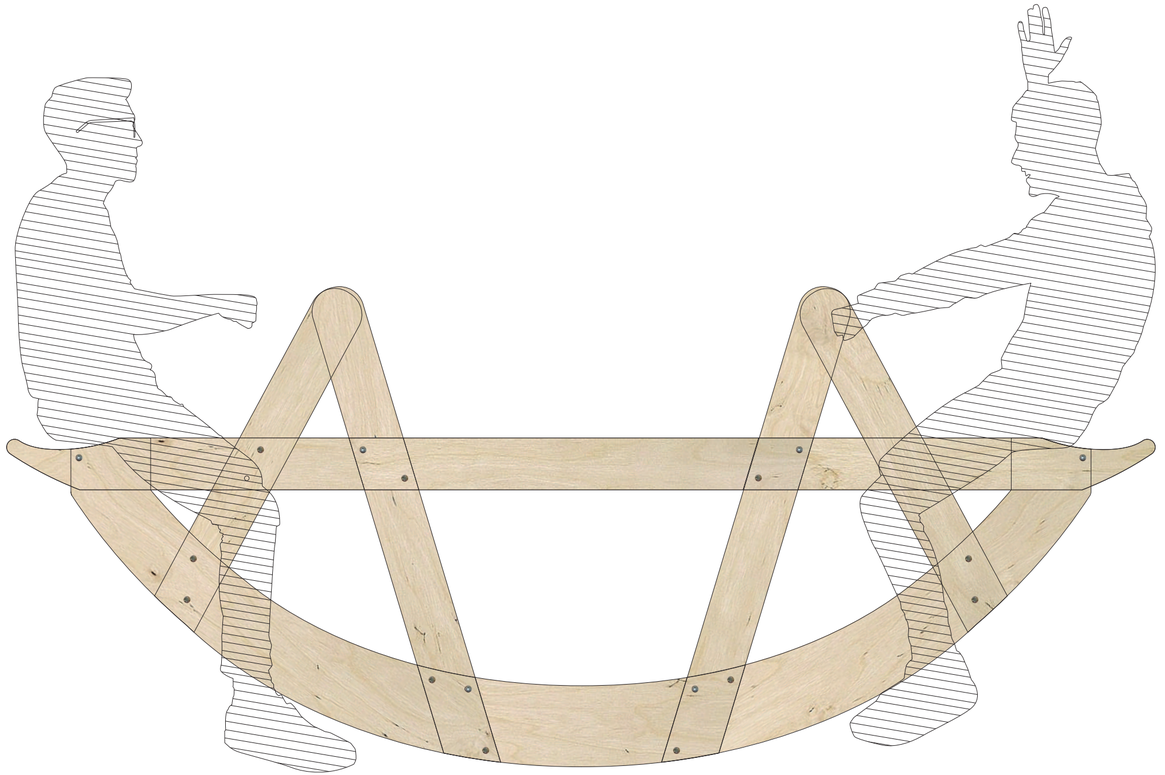
The most challenging part of this design was breaking down the seesaw into sections which fits onto 4x4 sheets of MDF. The reason for doing this is so small flatbed CNC cutters can produce the seesaw. (See all parts to the right)











DESIGN FREEZE FEEDBACK

My presentation happened to be the first test of the seesaw prototype 2... My tutors and lecturers Nigel Ball and Dean Standford gladly volunteered to be the testers.

Structural comments:
Seat comfort
Lots of flex in it
Its not stable enough

Playful:
Lots of laughter
Good height
Natural cooperation between the two of them was ace!

General:
Get it onto one sheet of 4x8
Email chopshop sheffield to get an idea of pricing

FOR MORE DETAILED IMAGES SEE FLIPBOOKS!!!!

TEST 1 (JOSH + LEWIS)

PLAY LEVEL -
MAX HEIGHT - 125 CM

COMMENTS:

Relationship – friends
Seesaw level - newbies

Lewis and Josh were incredibly excited to try out the seesaw (I didn't have to ask for their cooperation), they were also mischievously eager to push each other's limits on the seesaw. In this test they didn't reach the maximum height but the playfulness of their experience demonstrated that the seesaw is an object capable of provoking fun from the onset.

TEST 2 (CIARA + LIAM)

PLAY LEVEL -
MAX HEIGHT - 100 CM

COMMENTS:

Relationship – friends
Seesaw level - newbies

Ciara and Liam were asked to try out the Seesaw, they were more reluctant than other participants. The interaction between them was exploratory and nervous. This brought to light the fact that on a seesaw, you're placing your trust in the other person entirely. Ciara is 5ft 2 so its good to see the seesaw accommodates this.

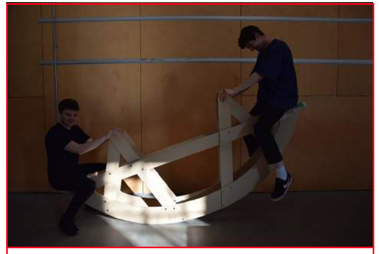
TEST 3 (ANTHONY + TOM)

PLAY LEVEL -
MAX HEIGHT - 160 CM

COMMENTS:

Relationship – friends
Seesaw level - 2nd play experience

This was the second time Tom and Anthony have played on the seesaw. Having this prior experience gave them the trust in the object to push it to its maximum.
Will the novelty ware off? No, "reaching the maximum height on the seesaw gives you that oh sh** moment" says Tom- It takes you to the edge!



TEST 4 (ROB + SAM)

PLAY LEVEL -
MAX HEIGHT - 130 CM

COMMENTS:

Relationship – strangers
Seesaw level - newbies

This test saw the participants develop have a more separated personal experience. As they don't know each other they were less focused on being playful with one another, smiling and laughing at the object and occasionally with each other. They were able to have a lot of fun, at a great height but this test was less socially successful than the others.

STRENGTH TEST 1 (JOE + JOE)

DESTRUCTION LEVEL -
STREGTH LEVEL -

COMMENTS:

During tests 1-4 the seesaw made a lot of audible creaks due to the number of bolts and connections in the design. This indicated that its weakest points would be venerable when submitted to twisting.
The seesaw withstood all the possible twisting two people could exert. The audible creaks are a note of concern for the user; although the seesaw is close to indestructible they communicate a lack of structure that indicates poor quality. This is an issue to be addressed in the next prototype.

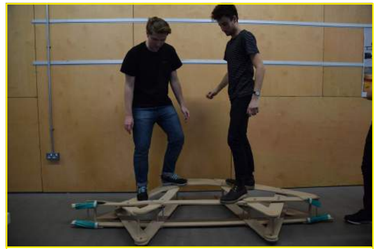
STRENGTH TEST 2 (MAX WEIGHT TEST)

DESTRUCTION LEVEL -

STREGTH LEVEL -

COMMENTS:

Design for misuse is integral to this design. This test saw the seesaws audible creaks raise to an uncomfortable level. The seesaw was also submitted to twisting with the combined mass of 360kg. Splitting of the material at the centre point of the curve was another structural issue raised as a result of this test. As this prototype is made from MDF (a weaker material) it highlights the weaknesses plywood may be exposed to after repeated use.



STRENGTH TEST 3

DESTRUCTION LEVEL -

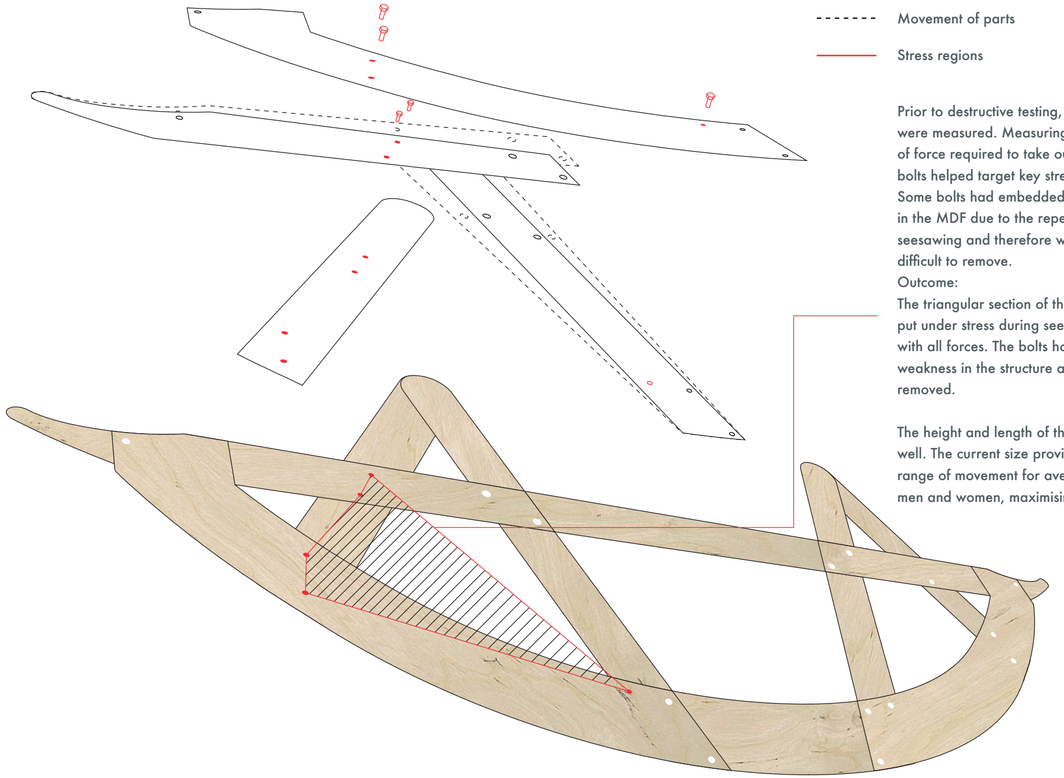
STREGTH LEVEL -

COMMENTS:

(For the pre-breaking structural review see the info graphic to the right)
On the advice of Engineer Steve Brandon “BREAK IT! Get two big heavy men to sit on it until it breaks, this will show you where the structural weaknesses are” the only way to break the seesaw was to flip it on its side and stand on it. It possible that the seesaw could be sat on in this manner so it should be able to withstand it.

IT WON’T GIVE UP!

Even after mostly destroying the seesaw it still functioned…
Outcomes:
<u>Structural</u>
I can reduce the vertical strength of the product.
Why?
The prototype was indestructible, made from a much weaker material than the final product will be (plywood).
Increase the products lateral strength.
Reduce splits and connections to avoid creaking.
Review the infographic to the right.
Include the seat design from prototype 1 in the 3rd version.
<u>Social</u>
The max height for the product is exciting.
Distance from user to user is far enough to be able to have a personal experience if wished.
The aesthetics of the seesaw should be more approachable.



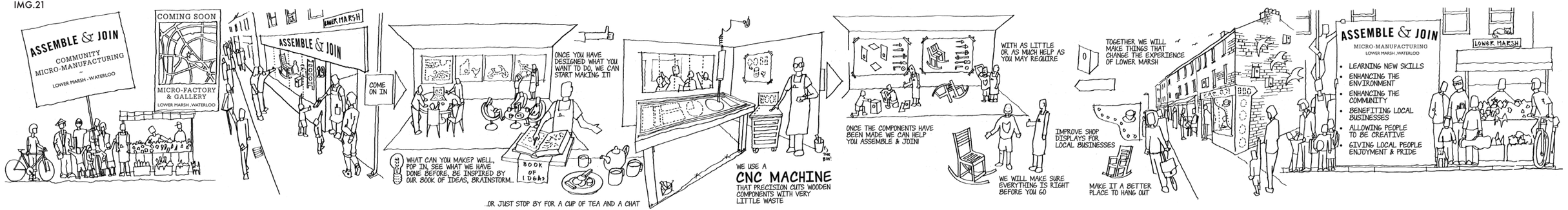
Prior to destructive testing, stress points were measured. Measuring the amount of force required to take out specific bolts helped target key stress areas. Some bolts had embedded themselves in the MDF due to the repeated strain of seesawing and therefore were extremely difficult to remove.
Outcome:
The triangular section of the seesaw put under stress during seesawing dealt with all forces. The bolts however are a weakness in the structure and need to be removed.

The height and length of the seesaw work well. The current size provides optimum range of movement for average height men and women, maximising the market.

Successful aspects of this design:
The second prototype was largely successful, the curve geometry allowed users to push with their legs and take each other to a comfortable but exciting height. The distance between the two users is also just right - at around 1.8 meters, the last thing I want is the seesaw to force users into each other's personal space. Each user instinctively knew how to operate the seesaw so there were no issues with semantics.

All the flaws in the first prototype have been addressed but not refined, prototype 3 should fine tune issues such as handles and comfort.

IMG.21



TOM TOBIA

Elliot - How do you inspire a community to build?
Tom - With the assembly and join project (illustrated above) you have to let people come to you.
Engagement was great
Execution was crap

Planning approval and safety standards shut down what ever we had come up with. So the people we had organized the project with said no to all its outcomes.

You hake it as simple and friendly sounding as possible
Avoid even the use of the word CNC machine!

So for your project say things like: (positive terms)
We make your staff happier in the workplace giving them time to play in their day.

Speak to:
Joni from Opendesk
(say Tom Tobia sent you his way)

Look up:
Assemble, Brutalist playground
Wevolver (built a community very quickly) (Richard +Bram

Elliot - What are the efficient simple to use methods of assembly?

Tom - Speak to Christopher Jarraat
There are as many 4ftx4ft CNC's machines as there are 4ftx8ft machines in the UK.
I would make your apparatus pieces for 8ftx4ft boards

Elliot – I'm looking to create a play graphic campaign, some help? Any advice.
Tom - Collaborations are possible
Send me a description of what your doing and I will send it to students
We could arrange a time to meet for anyone who's interested
(Could get some tips from them if anything)

WEEK 1 – EVERYONE WALKS PAST

WEEK 2 – THEY MIGHT LOOK IN THE WINDOW

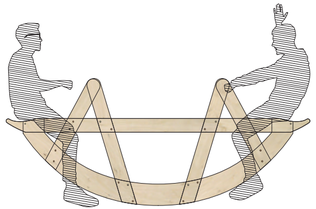
WEEK 3 – "WHAT ARE YOU ALL ABOUT THEN?"

PROTOTYPE 3

No bolts or fixings will be used in the product. The only benefit by including bolts is the semantic assurance to the user the product is safe. Bolt are a notable object of security within structures.

The negatives associated with the bolts far outweigh the positives. Creaking makes the object seem unsafe (caused by the botls). Tightening the bolts would have to be done by the user as a maintenance requirement. Its also cheaper to not include any externally sourced parts.

Hand assembly (no bolts) will help reduce the final cost for the user, making the product available to as many creative businesses as possible.

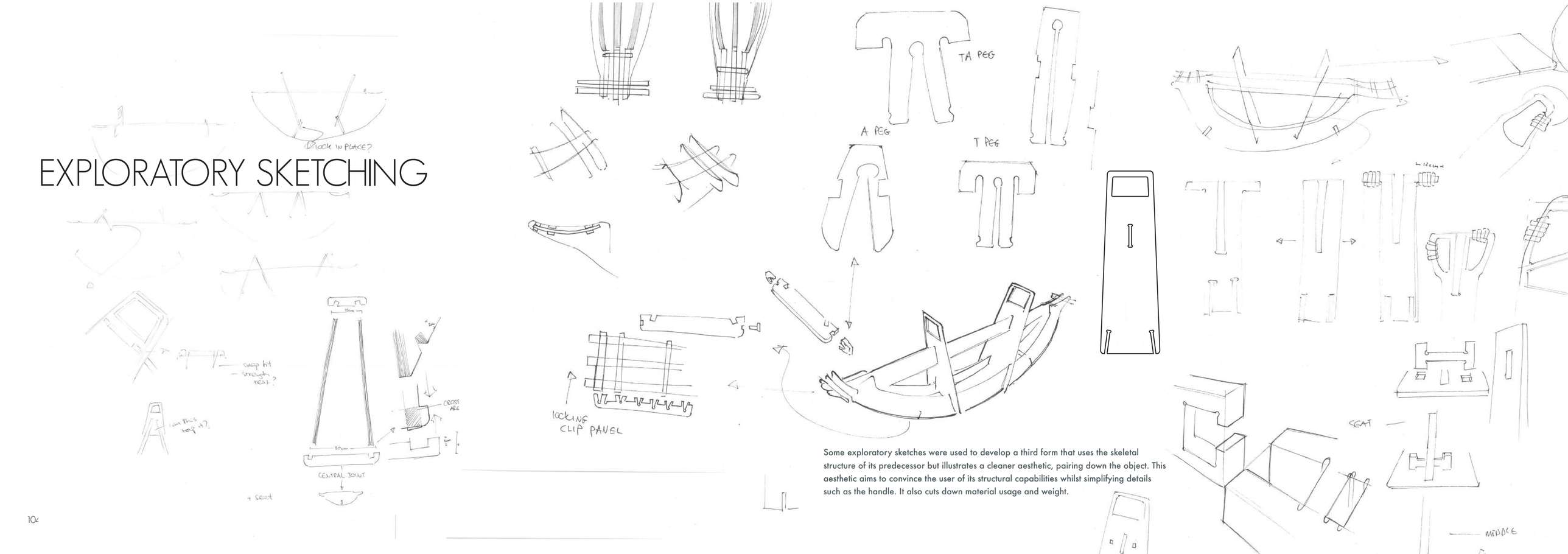


The third prototype will use no bolts; the design is less indestructible than the previous prototype. This provides the opportunity to work on the aesthetics of the product. Its form is very much defined by its function so the opportunity to add details is vital.

After speaking to Tom Tobia, I've decided to use 4x8ft sheets of plywood. On his advice the seesaw can be widely produced on the larger CNC machines. This also benefits the structure of the seesaw –joins down the centre of the seesaw can now be avoided. This plywood is also significantly stronger.

Using 4x8 sheets of plywood also provides an opportunity to reduce material, as larger parts can be cut from these dimensions. After some initial though the thickness of this plywood will sit in between 18mm and 15mm, this will keep the overall weight of the product to around 28kgs. By reducing weight the seesaw can be easily carried.

EXPLORATORY SKETCHING



Some exploratory sketches were used to develop a third form that uses the skeletal structure of its predecessor but illustrates a cleaner aesthetic, pairing down the object. This aesthetic aims to convince the user of its structural capabilities whilst simplifying details such as the handle. It also cuts down material usage and weight.

PROTOTYPE 3 INSPIRATION

The opensource community were my inspiration for creating fixings that click together. This method is easy to understand for the user assembling the product and is cost effective.

Ikea are a world leader in furniture and assembly but “the fiddly ritual of assembling IKEA furniture is set to become a thing of the past as the furniture giant introduces products that snap together "like a jigsaw puzzle"(Marcus Fairs, 2017).

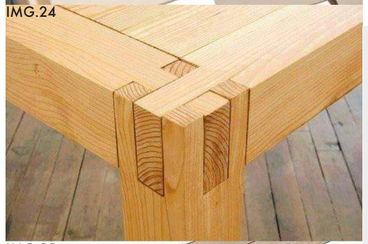
This shift by IKEA is something to emulate, their reputation on the line this direction alteration points to a future without bolts and allen keys.

This board demonstrates my basis to work on, after learning some joinery and open source principles with secondary research I can now focus my design work allowing any parts to succeed in testing faster.

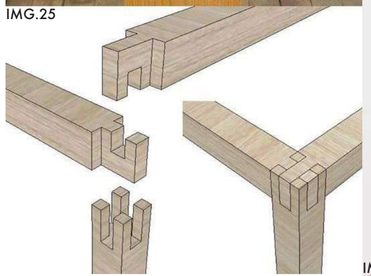
IMG.22

IMG.23

IMG.24



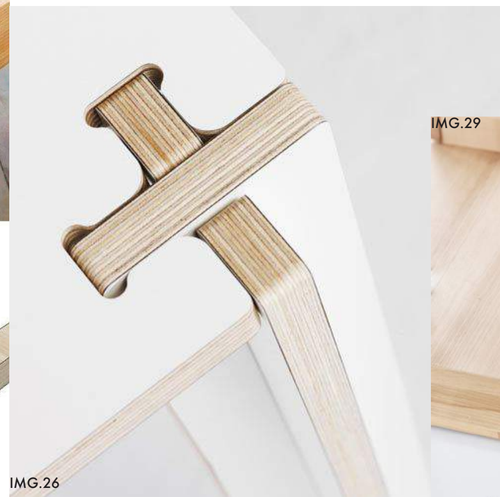
IMG.25



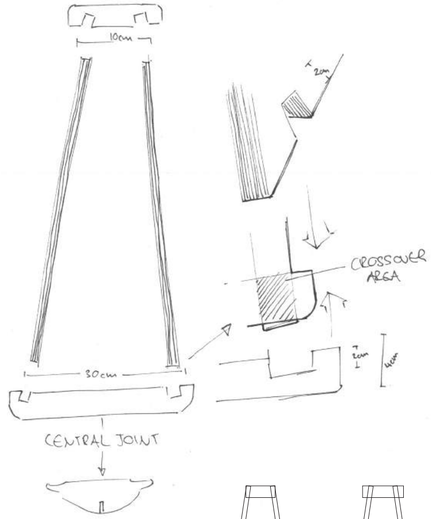
IMG.27

IMG.28

IMG.26



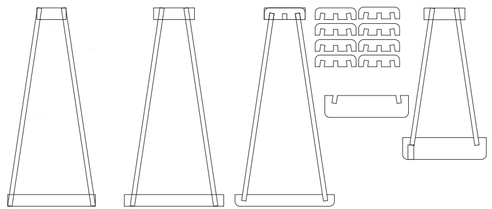
IMG.29



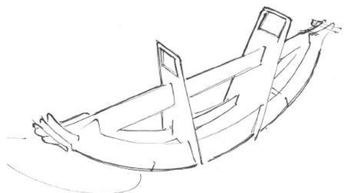
SPLAY

It's was noted by many users during the testing of prototype 2 that the base of the object was too narrow and felt unstable. In the second prototype the two curved sections have been splayed at a slight angle so that the seat area of the seesaw remains thin and the base now wide.

The larger sections of the 3rd prototype have been designed to a 10mm cutter so they can be cut with only one pass of the tool. This it's the most efficient method of CNC manufacture.



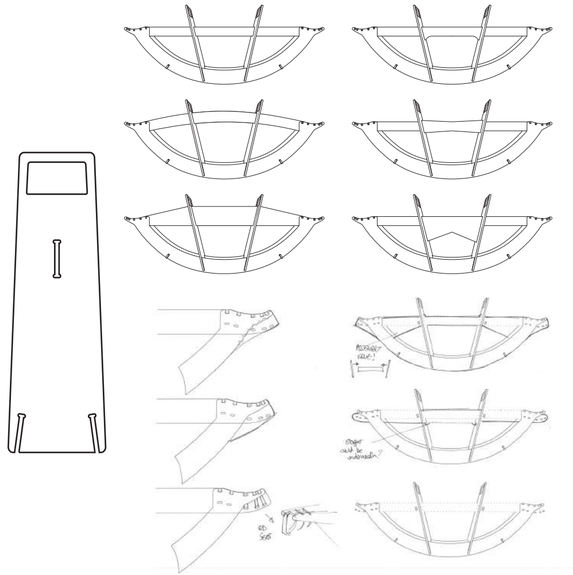
15 mm WBP play

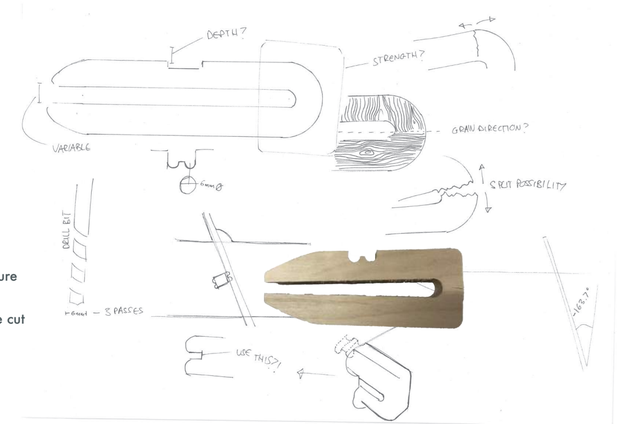


PEGS + HANDLE

Two panels (shown to the right) running adjacently form the main body of the seesaw now take on the structural responsibilities of the cross bracing used in prototype no2. The panels also now form the handles for the seesaw; combining functions is vital to lowering the cost of this product.

The panels however need to remain in place firmly so they can help the user gain momentum. By changing the long central panels form so the handle panel can butt up against it means the panel cannot move inwards.
To fix the panel so it cannot move outward a clip or peg of sorts could be used as a useful detail for the aesthetics of the seesaw whilst performing an integral function(see next page for clip development).



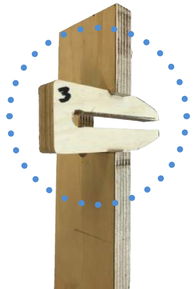


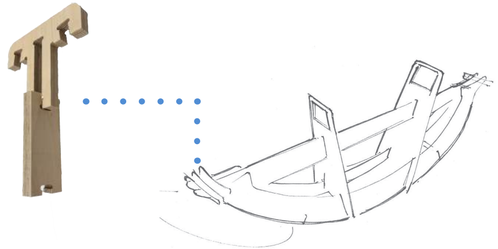
Some small-scale models, rouged out in the workshop, provided the opportunity to figure out the properties of the ply other than its strength. The third model clicked into the required slot firmly, measurements were then taken to draw up some further tests to be cut by CNC (shown above).

These tests have perfected the form of the clip. By varying the width of material and central gap it was noted that the plywood has a maximum flex of 5mm within the peg format. If this is exceeded the peg will split along its grain.

As this peg is a one-time use part repeated strain tests will not be conducted. Tests on its capability to hold in place when submitted to the forces involved in active play will be tested however.

The noise the peg makes is worth noting; the audible wooden click is another reference point so the user knows they have completed the building of the product correctly. The noise is also synonymous with security, it's a reassurance that the product is structurally ordered and perhaps engineered.

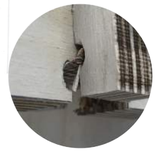


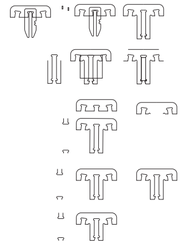


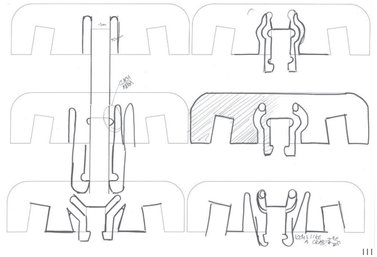
CLIPS

Now the handles have been secured the seats need to also be fixed. As shown above the seat area involves the connection of three large parts. I've chosen to fix the seesaw at the seats as it allows me to create a cross hatched effect. Fixing the seesaw at this point will allow me the ability to design a comfortable seat whilst maintaining the rigidity of the structure.
To fix the three parts in place a snap fitting will need to be used. Two arms in the centre of the piece lock the seat clip in place. The first modelling stage for these clips resulted in no flex, therefore the seat clips were not able to pass over the material and lock into place. (see A5 assembly drawings for details). Some further tests of the seat clips were created and refined by hand until the seat clips pushed into place by hand. The clips need to be pushed in with a degree of force so I asked colleagues to push a clip in to make sure it was feasible for anyone to perform this action.

Similarly, to the pegs on the previous page the clips lock into place with an audible click. This reassures the user that the clips are in place correctly. The clips are designed to be cut with a 6mm cutter, unlike the 10mm cutter the CNC flatbed requires two passes to cut each part with the 6mm tool. This was a necessary step as the parts require a finer level of detail.







CHOPSHOP PRICE UP

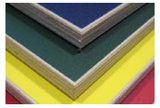
Customer:	Deadline	Collection Delivery
Elliot Macdonald		
Materials, Processing		**Price**
15mm Birch ply @ £41	1.5s	61.5
CNC Machining @ £45/h	1h	45
Post Processing @ £20/h	1h	20
	Total	126.5

Option 1 - Birch Ply - indoor and outdoor use.
Storage - Indoors
Not to be used in wet conditions.

15mm WBP ply @ £44	1.5sheet	66
CNC machining @ £45/h		45
Post Processing @ £20/h		20
	Total	131

Option 2 - Weather Boil Proof Ply - indoor and outdoor use.
Storage - Indoors or outdoors
To be used in all conditions

15mm Polypropylene coated ply @ £91	1sheet	136.5
CNC machining @ £45/h		45
Post Processing @ £20/h		20
	Total	201.5



Option 3 - Polypropelene coated Ply
n/a
This adds thickness to the board rendering the seesaw impossible to assemble.

WEATHER PROOFING

The seesaw is designed for indoor and outdoor use. The seesaw however cannot be left outdoors as Birch plywood is vulnerable to rot. Other types of plywood such as WBP (weather boil proof) Plywood can be used to manufacture the product. The simplicity of only using one material means the customer can specify to any maker which type of Plywood they would like.
WBP is “rated with low expansion and shrinkage, making them stable when used in all dimension.”

WBP Plywood can also be used externally as long as the edges and the face of the board are preserved with a treatment.(builderdepot.co.uk, 2017)

A matrix or options table needs to be made available to the user so they can specify to maker if they want a weather resistant seesaw or a regular one. After asking Chopshop Sheffield about making the Seesaw weather resistant they have suggested WBP plywood, this has reassured me that if a customer were to download the plans for the seesaw they would be in safe hands once they are in contact with a maker. Instead of dealing with the decision for which plywood the user wants it seems more appropriate to let the user decide whether it should be for indoor or outdoor use and let the maker decide the material in conjunction with the customer.
I’ve asked Chopshop about the finishing required for WBP plywood and they recommend outsourcing this to a local finishing business. It’s likely that if the customer were to order an exterior grade seesaw it would be marginally more expensive as it requires some hand finishing. This will be made clear to the customer when they download the plans for the seesaw.

CUT BY THE MAKERS

Observing the makers process from file to final cut:

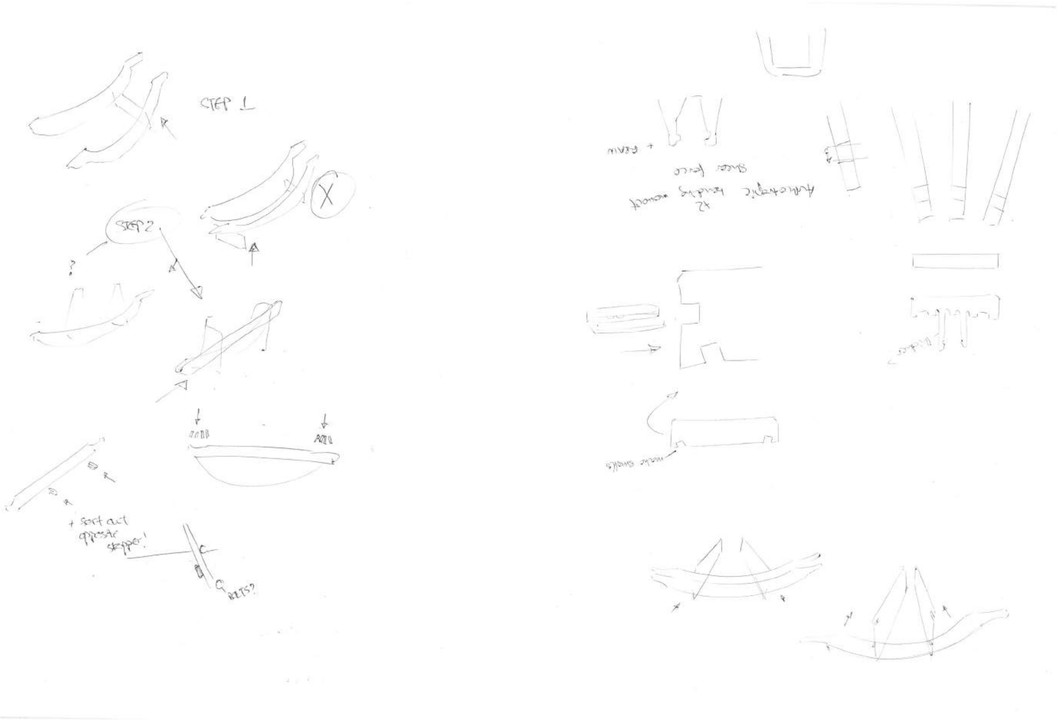
File Preparation (20 minutes)
- Import DXF file into Vcarve (a soft ware for flatbed CNC cutters)
- Select and delegate cutters to sections of the drawing
- Choose material size (this sets various things like cutter rotation speed)
- Allocate depth cuts (initial cuts drive material down, secondary cuts cut material upwards to avoid cracking on external plys)
- Allocate tabs to hold pieces in place.

CNC Cutting (60 minutes)
- Place material on flatbed
- Turn on vacuum suction
- Depending on the set up cutting the parts should only take 60 minutes maximum.

Hand finishing (10 minutes)
- break off the parts from the board using a small saw or chisel.
- The maker uses a small router to finish off any external imperfections.
- Sand off the handles and logo area.
- Wrap parts in cling film.

Getting the 3rd prototype cut by the makers gives me an idea of cost but it also allows me to get to know their process. I noticed whilst I was there that they own a CNC flatbed which autonomously changes its cutter tools mid cut. This drastically reduces cutting time, I previously thought that all cutters had to be hand fed, the same as the CNC machines in the University workshops.

The visit also triggered the question of how to communicate finishing and cutter types to the maker. A small document or technical drawing will need to come alongside the DXF file instructing these details.



ASSEMBLY

Please see A5 Assembly Instructions for final version.

The assembly of the product was initially though through whilst designing the parts. Some hiccups were hit once assembly stage was reached however. As the Seesaw hasn't been taken to CAD even at this late stage I've realised that the parts don't slots together in any order. For example, the two large curved sections of the Seesaw must be help under a slight squeeze to allow the brace to slot into place. By holding the two parts under tension the brace effectively locks the handle sections in place.
Its imperative that the user assembles the Seesaw in the correct order as each part added locks its previous piece under tension. This allows the Seesaw to remain rigid. As individual parts, the seesaw isn't anything special structurally but by designing the Seesaw without CAD I was able to work with the flex in the plywood to achieve a product that's strength is based on the interlocking of its parts.

PROTOTYPE 3 - ASSEMBLED

FINISH

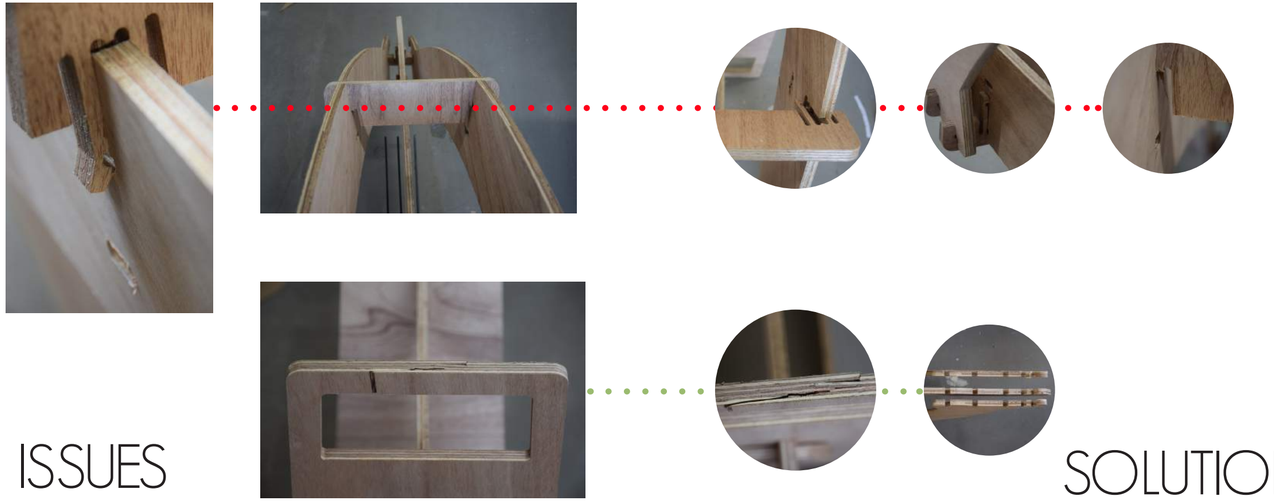
The quality of finish is out of my hands. By getting this prototype cut by makers (Chopshop Sheffield) I've learned that mistakes can be made but this is not my responsibility. Hypothetically speaking, if Opendesk were to take on this product in their range (I'm awaiting their response) the maker is liable for any errors with the product.

TOLERANCES

Now that the seesaw parts don't run parallel (prototype 2), sections that slot together require larger allowances. Some parts currently snap before they clip into place, the pressure on the part when its forced into position is too much. Also some clips don't meet their female part, this is a measurement issue. I also learnt at Chopshop Sheffield that each 4x8 sheet of plywood has varying thickness from 15.2mm to 14.69mm.

ASSEMBLY

The assembly took around 2 hours, for one person this seems long. A mallet was also required. Most of the assembly time was taken by tinkering, making small adjustments so the seat pegs were in alignment with the central beam. Also, the handle split whilst being hammered into position.



ISSUES

SOLUTIONS

FINISH

The makers (Chopshop Sheffield) offer a finishing service, this is £20 and they will sand all the edges and remove all the tabs added during the CNC cutting phase. This is an expense and I would like to keep the cost down but the chance of users getting splinters is high is finishing isn't done.

TOLERANCES

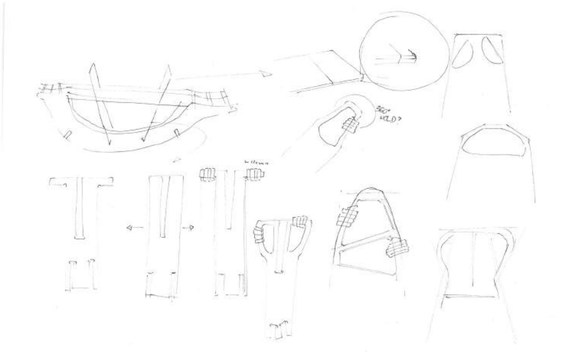
All drawings have been altered to account for material thicknesses varying. This has also solved the issue of many parts splitting during assembly. These next prototypes were generated for the Playday (see later). Some material thickness of parts has been added to avoid splitting. The section that split on this prototype were also cut in the wrong grain direction (shown below) so this has been changed.

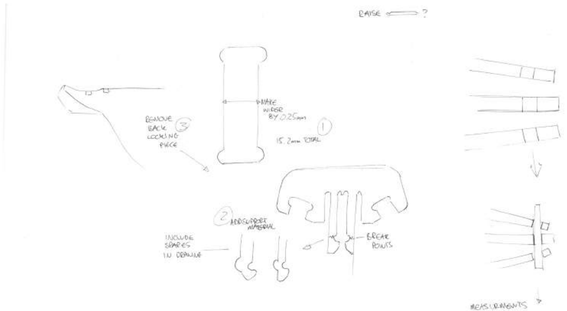
ASSEMBLY

Now the assembly has been perfected step by step the next few prototypes were much quicker to assemble at around 20 minutes. As the order of assembly has been completely altered the handle no longer needs to be hammered into place so it will no longer be at risk of splitting.

HANDLE

One main issue realised whilst playing on the seesaw with various colleagues was that the handles felt slightly flimsy. Some alternative handles designed were sketched out but after meeting with Steve Brandon (engineering expert) he recommended that the thickness of the handle should be increased. Even a small thickness change will result in an exponential increase to the strength of the handle. I then tested the results of the handle design on a colleague who stands at 6ft 4 so in turn has huge hands. They passed the test , see below.



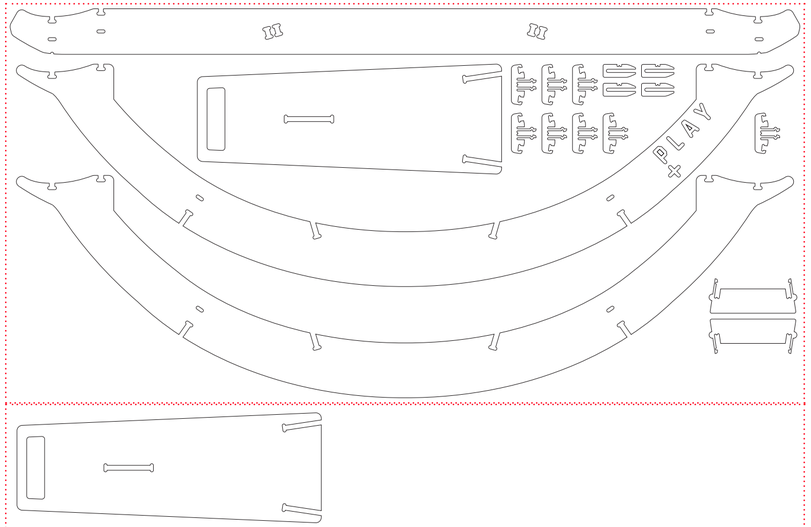


Whilst conducting the Playday I noticed that the seesaw is transportable, as designed. At around 25kgs the seesaw is transportable by hand. I however found it easier to pull the seesaws across the ground and in doing so found that they simply glide down sets of stairs! The curved sections on the base mean it slides across each step with no resistance.

At the end of the Playday there was some slight wear on the base edge of the Seesaw. Each Seesaw was used by around 80 people, I'm unsure of how long they were used for but this wear is to be expected. The wear was limited however, once the bottom edge of the plywood levelled off to meet parallel with the ground the wear decelerated.

Tolerances

Fortunately, by assembling a total of 3 seesaw prototypes all allowances for varying material thicknesses have been refined. This gives the product a reassuring feel each and every time it's assembled. Also, a number of users commented on how sturdy the seesaw feels and no users have made comments questioning its structural integrity. Ideally the product would be 'repeat stress tested', this is something id like to undertake if the seesaw were to be taken to market by an investor.



1 SHEET AND A TINY BIT...

I've now imported the CNC drawings into CAD (see exploded view on next page) although I know the seesaw are fully functioning but this will ensure the Seesaw fully fits together. It's also useful to have the parts in 3D CAD so if people were to view it online through certain open source software's it can be viewed in 3D.

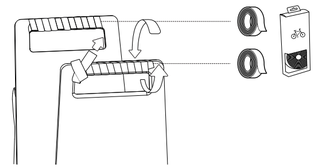
FINAL ADJUSTMENTS

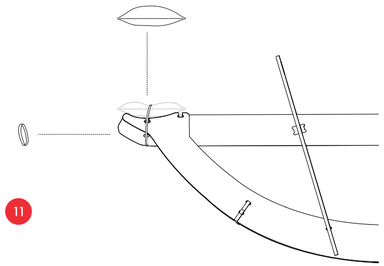
During prototyping Seesaw no.3 the decision was made to add cushions. The seat has been designed to be reasonably comfortable using 15mm plywood. The only method to improve the comfort of a plywood seat at this stage is to kerf some panels. Kerfing would cut the plywood into a flexible structure but this would not be as comfortable as a cushion. The method of attaching cushions is demonstrated in the assembly instructions and is a recommended open source option for customers.

It was also noted during the Playday that the handles can become sore after a long use. Some bevelling has been added to the handles edges (see technical drawing) the option for users to add bicycle handlebar tape to the handles has also been illustrated as an additional option.

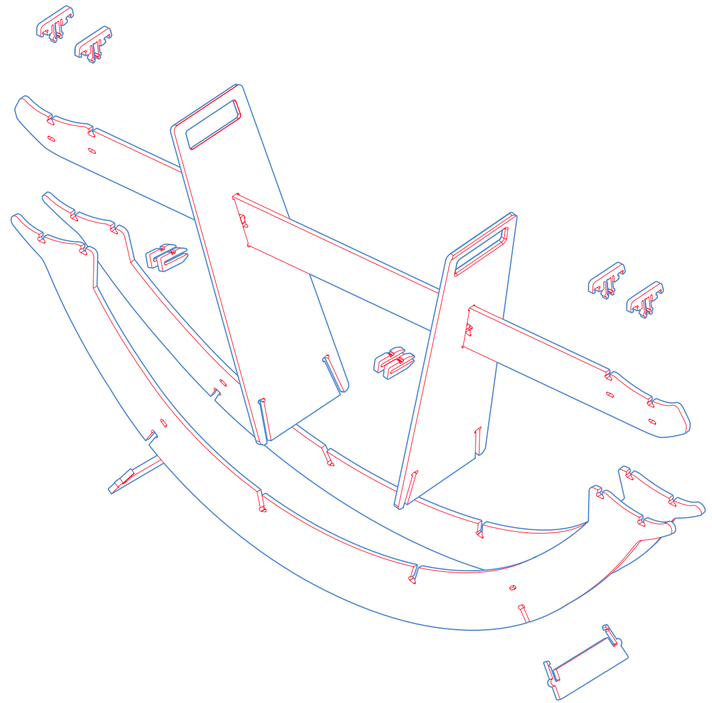
The logo will also be etched into the side of the seesaw at a depth of 3mm. The option for users to add their own logos onto the seesaw is illustrated in the Technical drawing too.

10





11



BIBLIOGRAPHY

BIBLIOGRAPHY

Author. (2016). Title. Retrived from

Page 8

Carl Honore. (2007) In Praise of Slowness. Retrieved from https://www.ted.com/talks/carl_honore_praises_slowness/transcript?language=en#t-56000

Page 9

Lauren Laverne.(2014). Why play is important to us all. Retrieved from https://www.theguardian.com/lifeandstyle/2014/oct/05/why-play-is-important-to-us-all-lauren-laverne

-

HBO. (2016) Westworld. Retrived from Netflix.com

-

Sandy Mann. (2016). Why are we so bored?. Retrieved from https://www.theguardian.com/lifeandstyle/2016/apr/24/why-are-we-so-bored

Page 10

Oliver Smith. (2016). Denmark regain title of happiest country.Retrieved from http://www.telegraph.co.uk/travel/news/denmark-regains-title-of-happiest-country/

-

Phillip Inmann. (2016). Britons working longer hours. Retrieved from https://www.theguardian.com/business/2016/mar/27/britons-working-longer-hours-with-no-gain-in-productivity-study-finds

Page 12

Dr.Stuart Brown. (2009). Play is more than just fun. Retrieved from https://www.ted.com/playlists/316/talks_for_your_inner_child

Page 13

Dr.Stuart Brown. (2009). Play is more than just fun. Retrieved from https://www.ted.com/playlists/316/talks_for_your_inner_child

Page 14

Lumiere. (2017). Lumiere Durham. Retrieved from http://www.lumiere-festival.com/durham-2017/

-

Guiness World records (2011). Largest water ballon fight. Retrieved from www.guinnessworldrecords.com/world-records/largest-water-balloon-fight

-

Kate Ravilous. (2010). Weather watch snowmen History. Retrieved from https://www.theguardian.com/news/2010/dec/29/weatherwatch-snowmen-history

Page 24

Rainbow play systems. (2015). 7 Types of play. Retrieved from http://rpsoftexas.com/blog/7-types-of-play/

-

Stuart Brown, M.D with Christopher Vaughan. (2009). Play: How It Shapes the Brain, Opens the Imagination, and Invigorates the Soul.

Page 29

Daily Tous Les Jours. (2014). The Swings. Retrieved from http://www.dailytouslesjours.com/project/the-swings/

Page 30

Snarkitecture. (2015). The beach. Retrieved from http://www.snarkitecture.com/the-beach/

+

https://www.youtube.com/watch?v=J3NMVpiJ0_A

Page 31

Cherrill Hicks. (2016). Whats behind the infant trend for adult play?. Retrieved from http://www.telegraph.co.uk/wellbeing/mood-and-mind/whats-behind-the-infantilising-trend-for-adult-play/

Page 32

Aya Husni Bey. (2017). Creativity Unmasked. Retrieved from http://creativityunmasked.com/about-aya/

Page 34

Charlie Tadd. (2011). The shared experience of absurdity. Retrieved from https://www.ted.com/talks/charlie_todd_the_shared_experience_of_absurdity/transcript?language=en

-

Dr.Stuart Brown. (2009). Play is more than just fun. Retrieved from https://www.ted.com/playlists/316/talks_for_your_inner_child

-

Stuart Brown, M.D with Christopher Vaughan. (2009). Play: How It Shapes the Brain, Opens the Imagination, and Invigorates the Soul.

-

Phillip Inmann. (2016). Britons working longer hours. Retrieved from https://www.theguardian.com/business/2016/mar/27/britons-working-longer-hours-with-no-gain-in-productivity-study-finds

Page 39

Olivia Mull. (2015). Carsten Holler. Retrieved from https://www.dezeen.com/2015/06/09/carsten-holler-decision-london-south-bank-hayward-gallery-playground-slides/

Page 42

Gabriela Burkhalter, Kunsthalle Zurich. (2016) The Playground Project.

Page 48

Secretary of State for Communities and Local Government . (2017). Retrieved from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/590464/Fixing_our_broken_housing_market_-_print_ready_version.pdf

Page 49

Tim Adams. (2017) Wonderland, how to play in the modern world. Retrieved from Play is addictive because it offers the potential for a different result each time we engage"(Steve Johnson

Page 51

humansvszombies. (2017) Retrieved from https://humansvszombies.org

page 52

M. Dexter cites Torrone (2012), the 'Unspoken Rules of Open Source Hardware'

Page 59

Tim walker. (2015). Perks for employees. Retrieved from http://www.independent.co.uk/news/world/americas/perks-for-employees-and-how-google-changed-the-way-we-work-while-waiting-in-line-8830243.html

+

http://uk.businessinsider.com/google-is-the-best-company-to-work-for-in-america-2016-4/#a-high-percentage-of-googlers-say-theyresatisfied-in-their-job-1

Page 61

CIPD and simply health. (2016). Retrieved from https://www.cipd.co.uk/Images/absence-management_2016_tcm18-16360.pdf

Paual Scher. (2016) Great design is serious. Retrieved from https://www.ted.com/talks/paula_scher_gets_serious

Page 62

Jessica. (2017). Receptionist at Electric Works.

Page 65

Opendesk. (2017). Why Opendesk. Retrieved from https://www.opendesk.cc/workspaces/why-choose-opendesk

Page 68

Opendesk. (2017). FAQs. Retrieved from https://www.opendesk.cc/faq

Page 69

Opendesk. (2017). FAQs. Retrieved from https://www.opendesk.cc/faq

Page 71

Opendesk. (2017). Why Opendesk. Retrieved from https://www.opendesk.cc/workspaces/why-choose-opendesk

Page 106

Marcus Fairs. (2017). IKEA Switches. Retrieved from https://www.dezeen.com/2017/03/06/ikea-introduce-furniture-snaps-together-minutes-without-requiring-tools/

Page 113

builderdepot. (2017) Retrieved from builderdepot.co.uk, 2017

IMAGE LIST

IMG.1 Brexit cartoon. Retrieved from http://www.politico.eu/interactive/brexit-eu-referendum-leave-david-cameron-boris-johnson-nigel-farage-ukip-cartoons/

IMG.2 – 5 Play Presentation. Retrieved from https://www.ted.com/playlists/316/talks_for_your_inner_child

IMG.6 Lumiere. Retrieved from http://www.lumiere-festival.com/durham-2017/

IMG.7 Water ballon fight Retrieved from Guiness World records (2011). Largest water ballon fight. Retrieved from www.guinnessworldrecords.com/world-records/largest-water-balloon-fight

IMG.8 Weather watch snowmen History Retrieved from https://www.theguardian.com/news/2010/dec/29/weatherwatch-snowmen-history

IMG.9 Kindergarten Retrieved from https://www.ted.com/talks/takaharu_tezuka_the_best_kindergarten_you_ve_ever_seen

IMG.10 The swings. Retrieved from http://www.dailytouslesjours.com/project/the-swings/

IMG.11 The beach. Retrieved from http://www.snarkitecture.com/the-beach/

IMG.12 Bouncy Castle. Retrieved from http://www.telegraph.co.uk/wellbeing/mood-and-mind/whats-behind-the-infantilising-trend-for-adult-play/

IMG.13 Aya Husni Bey Retrieved from http://creativityunmasked.com/about-aya/

IMG.14 – 15 Upside down goggles and slide. Retrieved from https://www.dezeen.com/2015/06/09/carsten-holler-decision-london-south-bank-hayward-gallery-playground-slides/

IMG.16 playground Development Retrieved from Gabriela Burkhalter, Kunsthalle Zurich. (2016) The Playground Project.

IMG.17-18 Army game. Retrieved from https://humansvszombies.org
+
http://news.hjnews.com/features/hundreds-of-usu-students-participate-in-humans-vs-zombies-game/article_03cf6ac6-ec56-11df-adfb-001cc4c002e0.html

IMG.19 Open desk furniture context. Retrieved from www.opendesk.cc

IMG. 20 Little tykes toy. Retrieved from http://www.chinacreativetoys.com/play-seesaw/rocker-seesaw.html

IMG. 21 Assemble and join story board. Retrieved from http://citiesnext.com/project/assemble-join-a-community-micro-manufacturing-workshop/

IMG.23 – 29 Inspiration board retrieved from
https://uk.pinterest.com/source/popularwoodworking.com
+
https://uk.pinterest.com/source/design-milk.com/
+
https://uk.pinterest.com/pin/455215474823078582/
+
https://uk.pinterest.com/pin/455215474823078803/
+
https://uk.pinterest.com/pin/455215474823081576/
+
https://www.dezeen.com/2017/03/06/ikea-introduce-furniture-snaps-together-minutes-without-requiring-tools/