

EDP Phase 1 presentation  
11.02.19  
Group 9

# the team



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“Nurturing nature in children aged 5-12.”

# user group selection

To select a user group we needed to consider their accessibility, underserved need and opportunity to develop a product-based solution to fulfill this need. Our approach to selecting a user group was heavily divergent.

## points of interest

We considered all prevalent issues and accessible user groups brought forward by team members without consideration of the brief.

Once compiled, we applied the constraints of the brief to see how viable each user group and specific issue was.

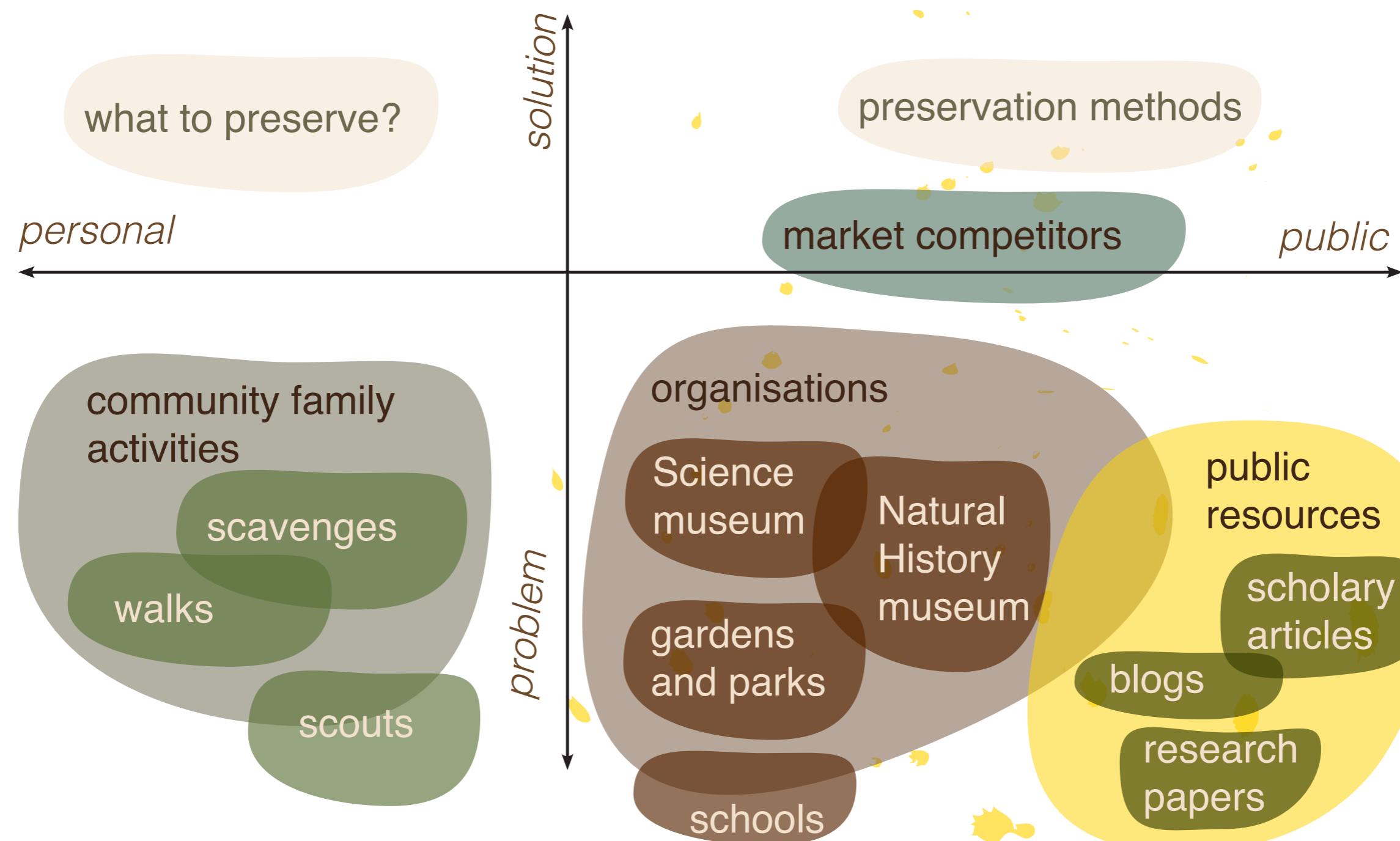
post truth  
migrant crisis  
social media and screen reliance  
stress habits  
loneliness  
dexterity  
mental health  
home-bound people

partially blind  
elderly  
diabetics  
preteens  
arthritic people  
people with mental wellbeing issues  
cleaners and service personnel

The final 2 were selected through votes.

# summary of research and approach

Gaining varied and long-term contact with our user group was crucial for developing empathy and finding genuine problem areas. This allowed preconceived assumptions of our user group to be disregarded. Therefore, this was another divergent point in our work. The team was split to perform different types of exploratory research.



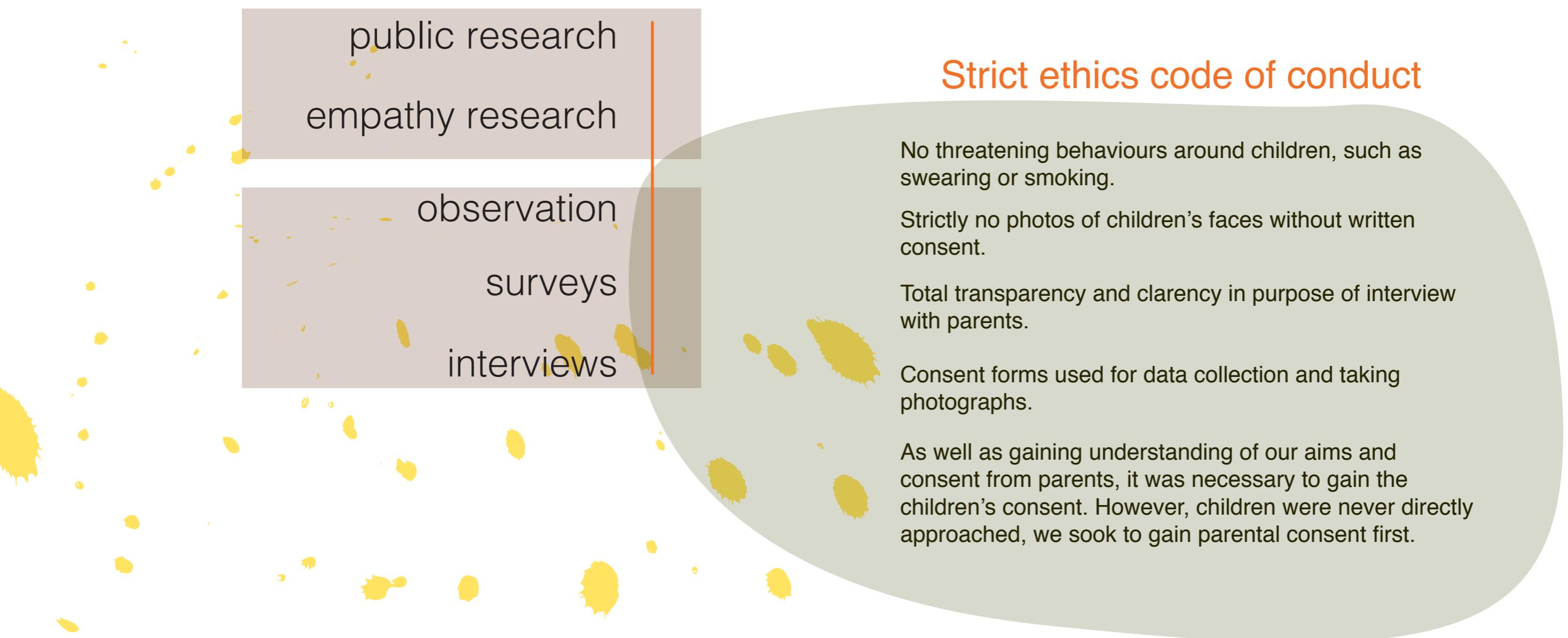
We aimed to contact both the user and those close to them such as educators, parents and organisers of activities aimed at children. This was partially due to the sensitive nature of contacting children as well as educators and guardians being heavily involved in decisions made with regards to their children.

# methodologies and ethics

Since the team is working with children, we had to lay out and clarify strict ethics.

Decided to contact parents directly and obtain verbal and written consent to work with their children: observing children, taking pictures of children, talking and interacting with them

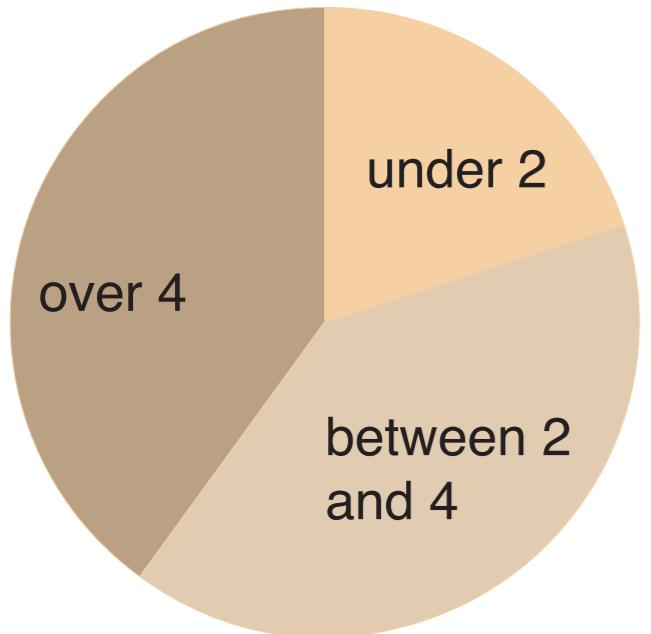
Transparency: we made it clear for what purpose the information gathered would be used, i.e. academic reports, presentations and inside marketing/branding within the school. Explaining clearly who we are and why we are approaching the people.



# initial findings

Secondary research was initially conducted through surveying our siblings and their wider circles. This aided us in discovering unexpected problem areas.

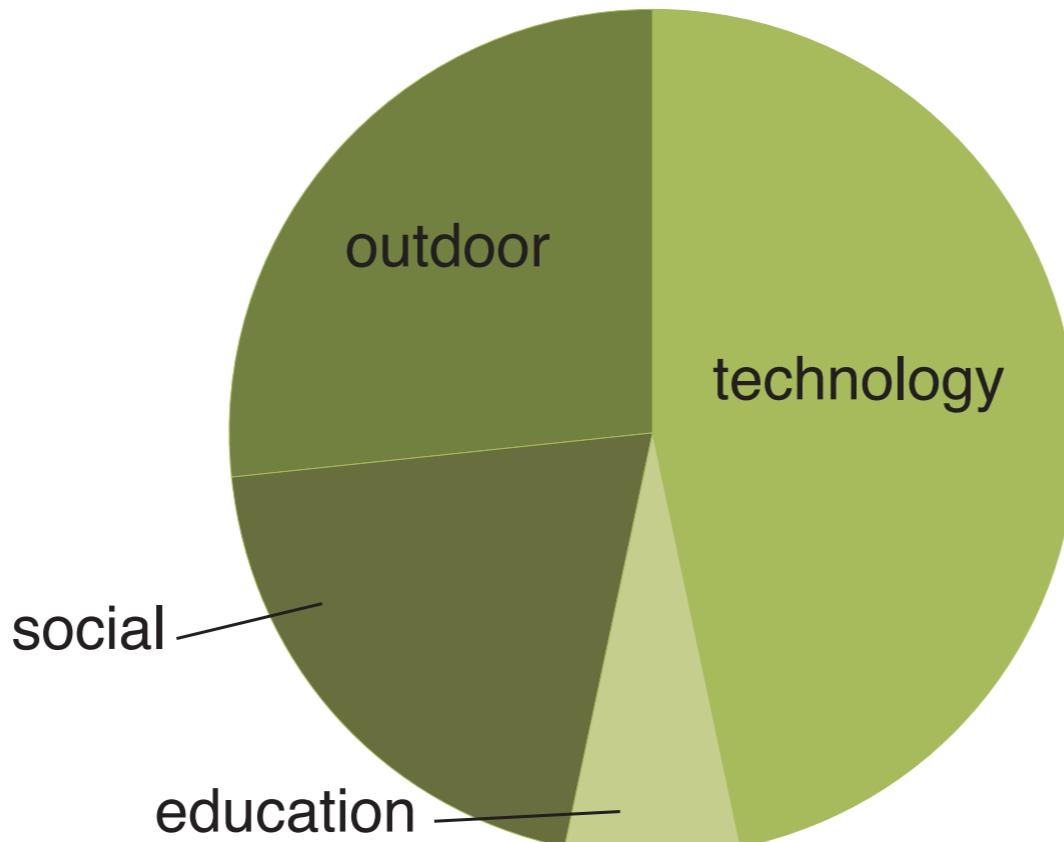
How many hours do you spend on your phone daily?



Sample size = 12

From these surveys repeated issues were picked up as well as ones that were of interest to us.

What do you do in your free time?



pre-teens:

are aware of their lack of knowledge of finance  
find it hard to develop a healthy relationship with technology

enjoy and often prefer playing outdoors

often feel they haven't got the knack for speaking fluently yet

# runner up opportunities

We narrowed down the problem areas to fit the brief and so considered areas that could be solved with a battery-operated handheld tool. This led to the areas of relationship and time spent in nature, public speaking confidence and phone reliance being tackled.

public speaking device

phone locking device

Many children from our initial research struggled with public confidence and speaking. We saw an opportunity to develop a product to help children develop and practice those skills on their own accord.

Sleep loss and deprivation due to overuse and dependence on mobile devices is becoming a prominent issue in pre-teens (especially children who struggle with time management). There is a product opportunity to create a device that puts incentive into avoiding the use of phones and help children learn how to be productive and manage time in a fun way.

# desk research

“Time spent outdoors has halved within one generation.”

64% of children play outside less than once a week.

Kids nowadays are entertaining themselves indoors rather than outdoors. This may be due to a lack of entertainment associated with the outdoors, or lack of access to outdoor facilities.

Kids are spending less and less time outdoors

This could be partly responsible for the increase in overweight children

This also suggests that currently there is a lack of interest in outdoor activities.

43% of adults think that their child should not play outdoors.

Many parents believe that it isn't safe for their kids to play outdoor. This is however unjustified as nowadays more children are admitted to hospitals for injuries incurred falling out of their beds rather than falling out of trees.

This shows that parents are also partly responsible for lack of time kids spend outdoor.

This statistic however also shows that more than half of parents believe that there is a benefit of kids playing outdoors justifying market demand.

28% haven't been on a country walk in the last year.

A survey of 2000 eight to twelve year olds, for the TV channel Eden shows that over a quarter of the recipients have not even had the luxury of going on a country walk over the past year.

Another concerning statistic is the kids who completely haven't had exposure to the country.

This shows the separation of city kids to country life. This is an underserved issue as kids are missing out on valuable life.

## Sources:

<https://childmind.org/article/why-kids-need-to-spend-time-in-nature/>

<https://www.nationaltrust.org.uk/features/connecting-kids-with-nature>

<https://www.theguardian.com/lifeandstyle/2010/aug/16/children-nature-outside-play-health>

# user insights: tactile research in Hyde Park

To gauge the possibilities of what could be gathered freely from nature in cities an exploratory walk was done. This resulted in finding many samples with a wide range in textures, colours and form.



insights:

- wide range of collectable organic material

## - hygiene and safety

As expected in any city environment, there were many pieces of rubbish including broken glass or even needles. We would have to consider carefully how to allow children to roam and explore the natural surroundings freely whilst remaining safe.

## - disruption of nature needs to be taken into consideration

There were many samples that could have been picked, often these would be more desirable. Our solution would need to promote the collection of fallen samples rather than the disruption of nature.

Alongside this we conducted a second survey to determine what children would want to collect from nature.

“a person made from twigs or leaves”

“daisy-chains”

“a birdhouse”

“a wreath from twigs”

“a shelter”



These showed us that children weren't solely interested in collecting samples but in processing them and making something from the material.

# user insights: nature walk in Margravine Cemetery

We attended a local nature walk in Hammersmith's Margravine cemetery. This event was aimed at children and families to scavenge the area, as well as to promote community cohesion.



insights:

- relationship with nature is being passed on through generations

Having conducted interviews with organisers and parents it became apparent that many of them had childhoods with a strong grounding in nature and were keen to pass this on to their children.

- parents tend to be overprotective (in some people's opinion)

Again this was discovered through interviews as well as observation. The parents at the walk were keen to promote their children to play freely.

- motivation for parents to take kids outside are:

1. low cost activity
2. kids develop environmental consciousness
3. easy and accessible way to keep children active

# user insights: natural history museum

The investigate centre at the Natural History museum was visited. The purpose of the centre is to promote the general public looking at, interacting with and teaching them. Speaking to the staff there it became apparent that most visitors were families with young children.



insights:

- special area for 'hands-on' tactile research designated for children to accommodate learning
- children were more engaged through the use of their hands rather than simply looking behind glass
- classification is an important part of learning about nature

They had relatively simple interactive classification boards for insects among other things. Our product could begin to introduce children to the concept of classification.



# GREENPEACE

**Gabriella Woolacott**, a door to door fundraiser for GreenPeace. As well as being very receptive of our concept of nurturing nature in children she added that 'renaturing cities' is a big concern for her. This is something that our product could also promote.

# user insights: science museum

As well as attending the WonderLab exhibit, contact was gained with members of staff from the exhibit and school teachers within.



## insights:

- exhibits for children need to be intuitive, highly interactive and tactile

It became apparent that the exhibit was highly interactive with emphasis on engaging senses of sight, touch, smell and sound. However, children were easily bored with simple exhibits and so our product would need to consider this and include many sensory processes.

- classroom learning is strengthened and informed by fieldtrips that involve experiential and exploratory learning

From interviewing the suburban Essex school teacher we discovered how our product could inform classroom learning. This also opened up another user we could market our product to, schools and educational field trips.

- identification sheets and prompts are used in engaging children in outdoor activities

These are heavily used in field trips to guide exploration and learning. Our product could be paired with some such system.

# personas



## “Bird lady”

No kids but loves hiking, walking and birdwatching for fun. Has extensive knowledge of insects and birds. Had an upbringing based in nature and played without bounds as a child. Thinks children are being over-protected and restricted in their exploration nowadays. Loves to share her knowledge with the wider community and younger generations.



## “Tree-hugger dad”

Father of 3 young kids. Grew up in rural Scotland but is now based in London. Often goes on nature-based outings as a family where they can run freely since they're 'so full of energy'. Enjoys bird watching as does his middle son. Encourages getting down and dirty when playing.



## “City girl”

Loves making mud-pies, collecting leaves, playing with natural materials but doesn't know much about nature or the environment. She has busy parents who aren't too bothered about nature. Only really engages with nature when visiting grandparents or on occasional trips to the countryside.

# our product

Through the insights we have gained from extensive user research we will develop a solution to nurturing nature in children.

Our product will keep children active, curious and environmentally conscious. It will preserve natural specimens in a fun and interactive way. As part of a wider kit it will guide children in what to collect as well as providing a tactile process to make a collection from the specimens. Our product will promote the study and exploration of nature but never the disturbance of it.



It will be designed for children but cater to a wider market of nature enthusiasts.

# commercial context



flower press  
£31.60



9-in-1 Kids Nature Explorer Kit  
£24.99



electric twig cutter  
£118.99



herbarium cupboard  
£2000.00

- not portable
- restricted in range of samples it can preserve (2D)
- price - competitive

- expensive
- not suitable for children
- not personal
- unsafe
- not intuitive to use

- preserves samples for decades
- in no way portable
- not suitable for hobbyists
- extremely high RRP

# market competitors

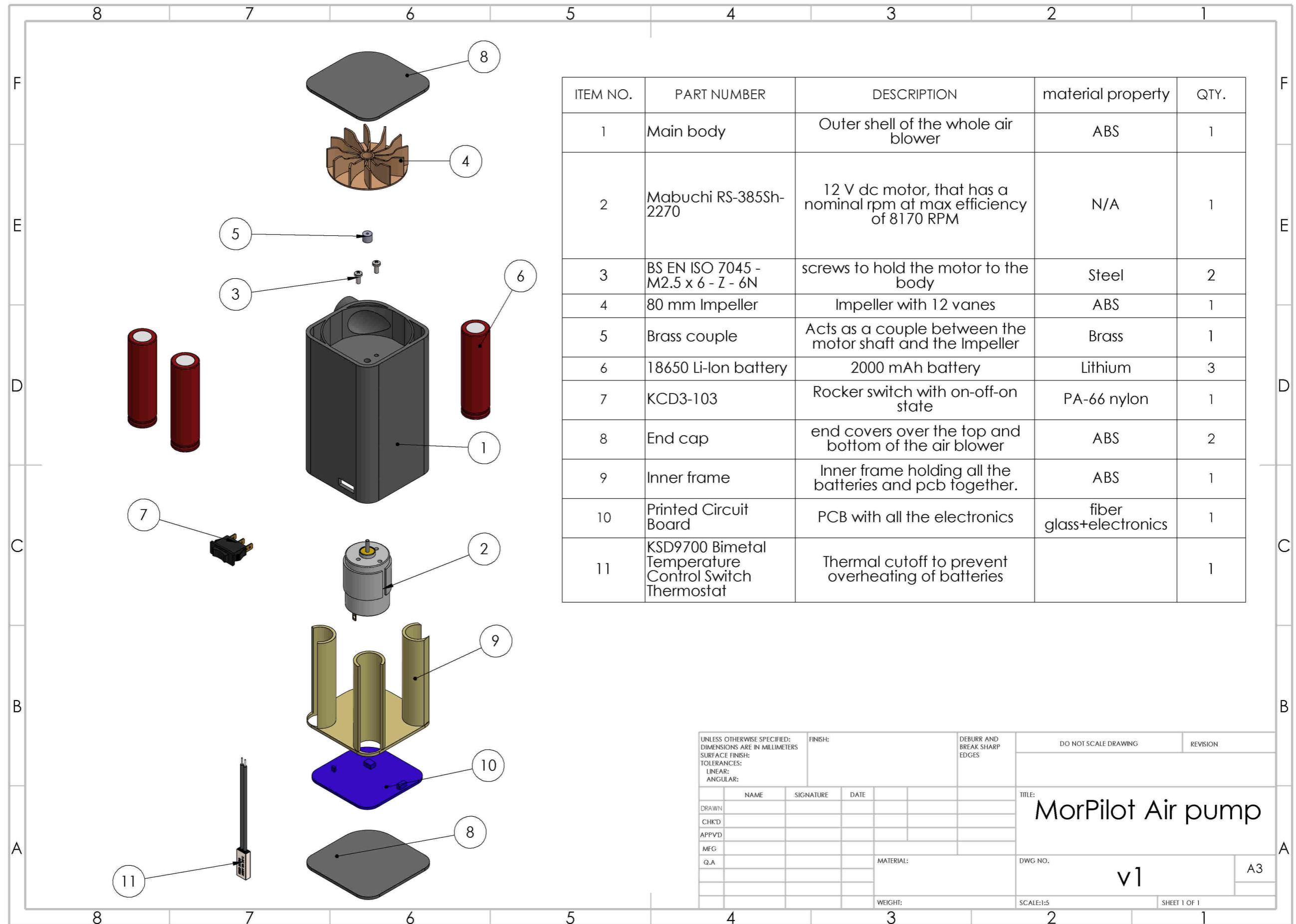


Research in the gift shops of the Natural history and Science museums was conducted. Although many of the products did not focus on the collection, preservation and education of nature for children there were similar products. These were analysed to complement our market opportunity research.

- price ranges: £4.99 - £35.00
- small scale
- some are simplified versions of specialist scientific equipment



# component breakdown



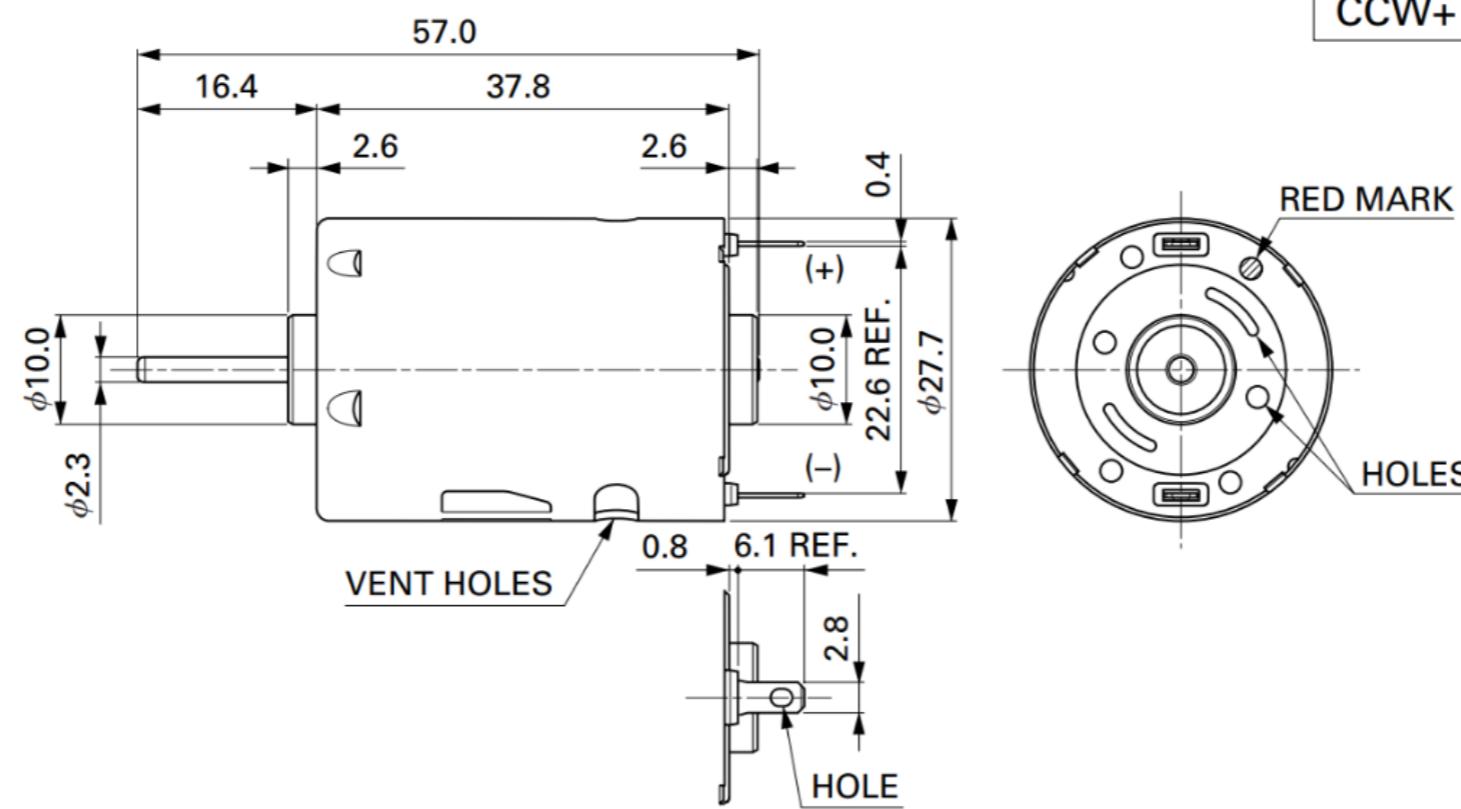
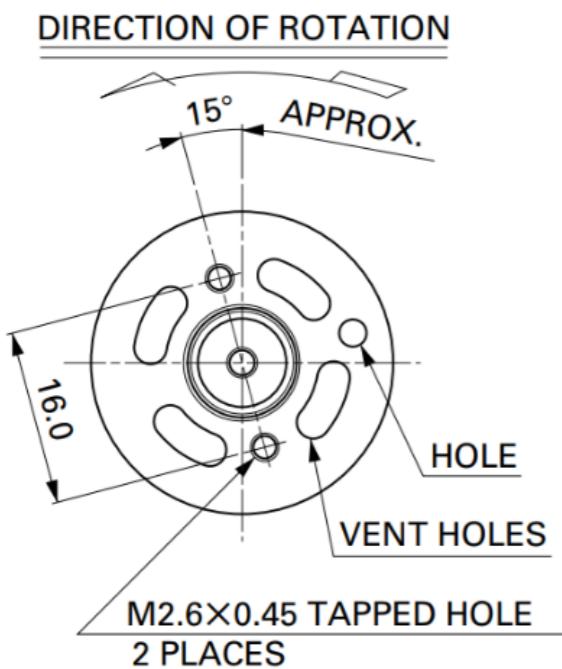
# Mabuchi RS-385 DC motor Specification

## points of interest

- high rpm for a fan
- high power consumption

## typical applications

- hair dryer
- printer/ copy machine
- ideal to make an air blower or compressor



Usable machine screw length 3.0 max. from motor mounting surface.

UNIT: MILLIMETERS

MODEL	VOLTAGE		NO LOAD		AT MAXIMUM EFFICIENCY				STALL				
	OPERATING RANGE	NOMINAL	SPEED	CURRENT	SPEED	CURRENT	TORQUE		OUTPUT	TORQUE			
			r/min	A	r/min	A	mN·m	g·cm	W	mN·m	g·cm	A	
<b>RS-385SH-2270</b>	(*1)	6~24	12V CONSTANT	10000	0.20	8170	0.89	7.89	80.5	6.74	43.2	440	4.00

# 18650 Battery Specification

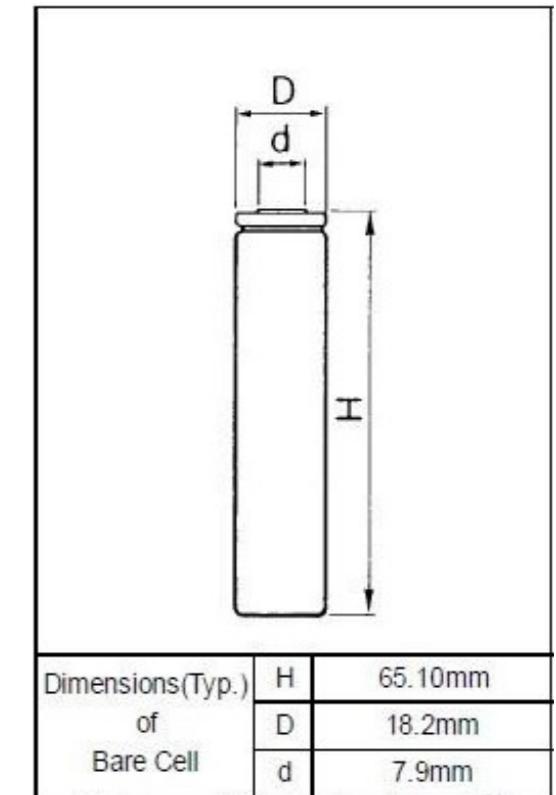
- lithium ion battery
- high power output
- rechargeable
- high energy density
- long stable power and long run time
- ideal for notebook PCs, boosters and portable devices



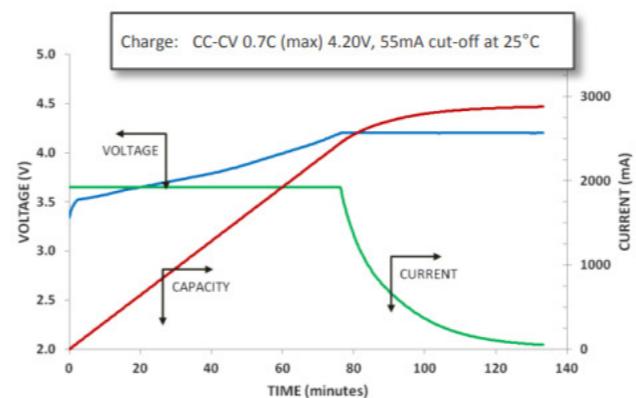
Our donor product contains 3 batteries with a total capacity of 6600mAh

## 5. BASIC CHARACTERISTICS

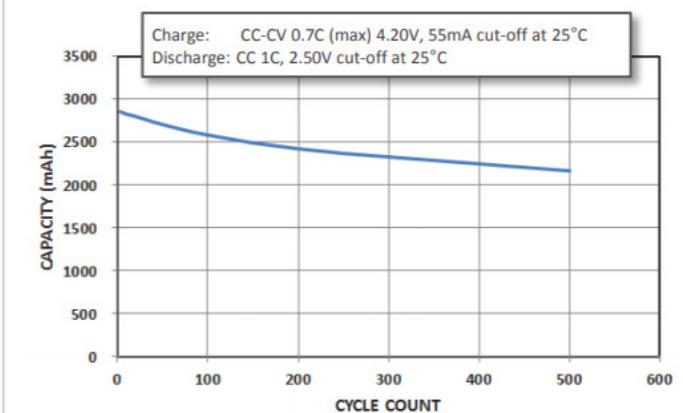
5.1 Capacity (25±5°C)	Nominal Capacity: 2600mAh (0.52A Discharge, 2.75V) Typical Capacity: 2550mAh (0.52A Discharge, 2.75V) Minimum Capacity: 2500mAh (0.52A Discharge, 2.75V)
5.2 Nominal Voltage	3.7V
5.3 Internal Impedance	≤ 70mΩ
5.4 Discharge Cut-off Voltage	3.0V
5.5 Max Charge Voltage	4.20±0.05V
5.6 Standard Charge Current	0.52A
5.7 Rapid Charge Current	1.3A
5.8 Standard Discharge Current	0.52A
5.9 Rapid Discharge Current	1.3A
5.10 Max Pulse Discharge Current	2.6A
5.11 Weight	46.5±1g
5.12 Max. Dimension	Diameter(Ø): 18.4mm Height (H): 65.2mm
5.13 Operating Temperature	Charge: 0 ~ 45°C Discharge: -20 ~ 60°C
5.14 Storage Temperature	During 1 month: -5 ~ 35°C During 6 months: 0 ~ 35°C



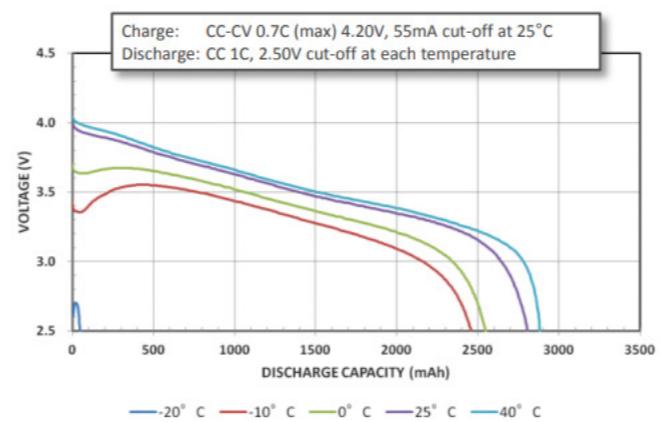
## Charge Characteristics



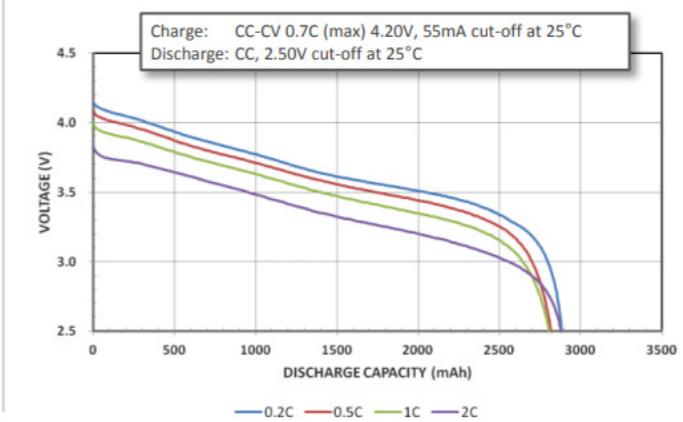
## Cycle Life Characteristics



## Discharge Characteristics (by temperature)



## Discharge Characteristics (by rate of discharge)

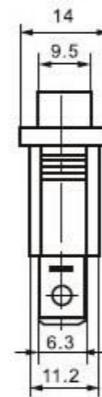
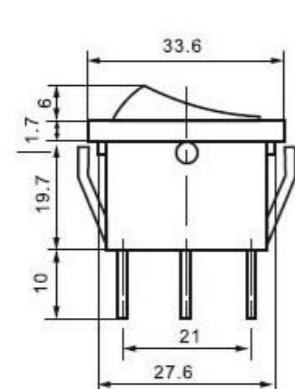


# KCD3-103 rocker switch Specification

- KCD3 - 103 rocker switch
- comes with three settings
- max voltage: 250V
- max current: 5A
- can be used in our future product



KCD3-103  
10A 250V/AC 15A 125V/AC



# KSD 9700 Thermal cut-off Specification

## points of interest

- thermal fuse that will cut off if the temperature of the batteries gets too hot
- uses a bimetallic structure to cut off the current
- cut off temperature and reset temperature is different for different models



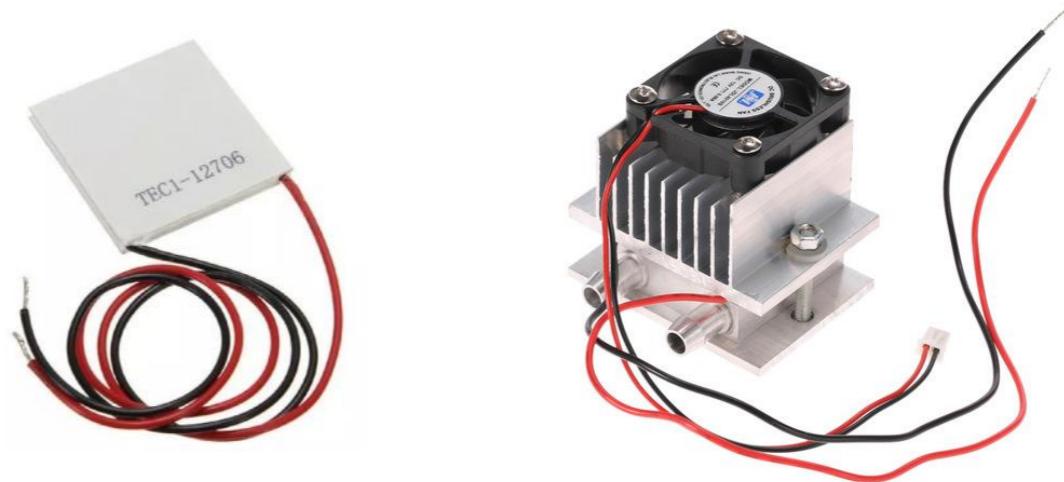
## KLS5-KSD9700 Thermal Fuse Series

Rated Voltage: AC250V/AC125V;  
Rated Current: 5A ~ 7A  
Electric intensity: 800V Min.  
Contact resistance: 30mΩ Max.  
Insulation resistance: 100MΩ Min.  
Response speed: ≤1°C/ min  
Number of automatic cycles: 6000 Max. (Resistive Load)

# components

hardware we can get:

We could utilise a peltier cooler in the preservation of our samples.



We will require a mechanical force multiplier that will compress samples taken from nature. This will require steel gears to transfer power from the motor.



# next steps

- Development of Instagram page 'root.explorer'. Utilise social media as a research, feedback and point of user contact.
- Initialise solution based research looking at additional components required, anthropometrics, ergonomics and 3D modelling.
- Continuation and up-keep of developed user contacts, this is central to our work.

	14-20 Jan	21-27 Jan	28 Jan-3 Feb	4-10 Feb	11-17 Feb (DRAW)	18-24 Feb	25 Feb - 3 March	4-10 March	11-17 March
Research									
User group contact									
Ideation									
Ergonomics									
CAD Modelling									
3D Modelling									
Product requirements									
Component selection									
Primary focus of divergent research and gaining user contact from which insights and initial ideation will take place.			Culminating research and starting donor product teardown. These activities leading to ideation and 3D modelling.			Modelling and idea development as well as focusing on selecting necessary components for the product to fulfil its function.			