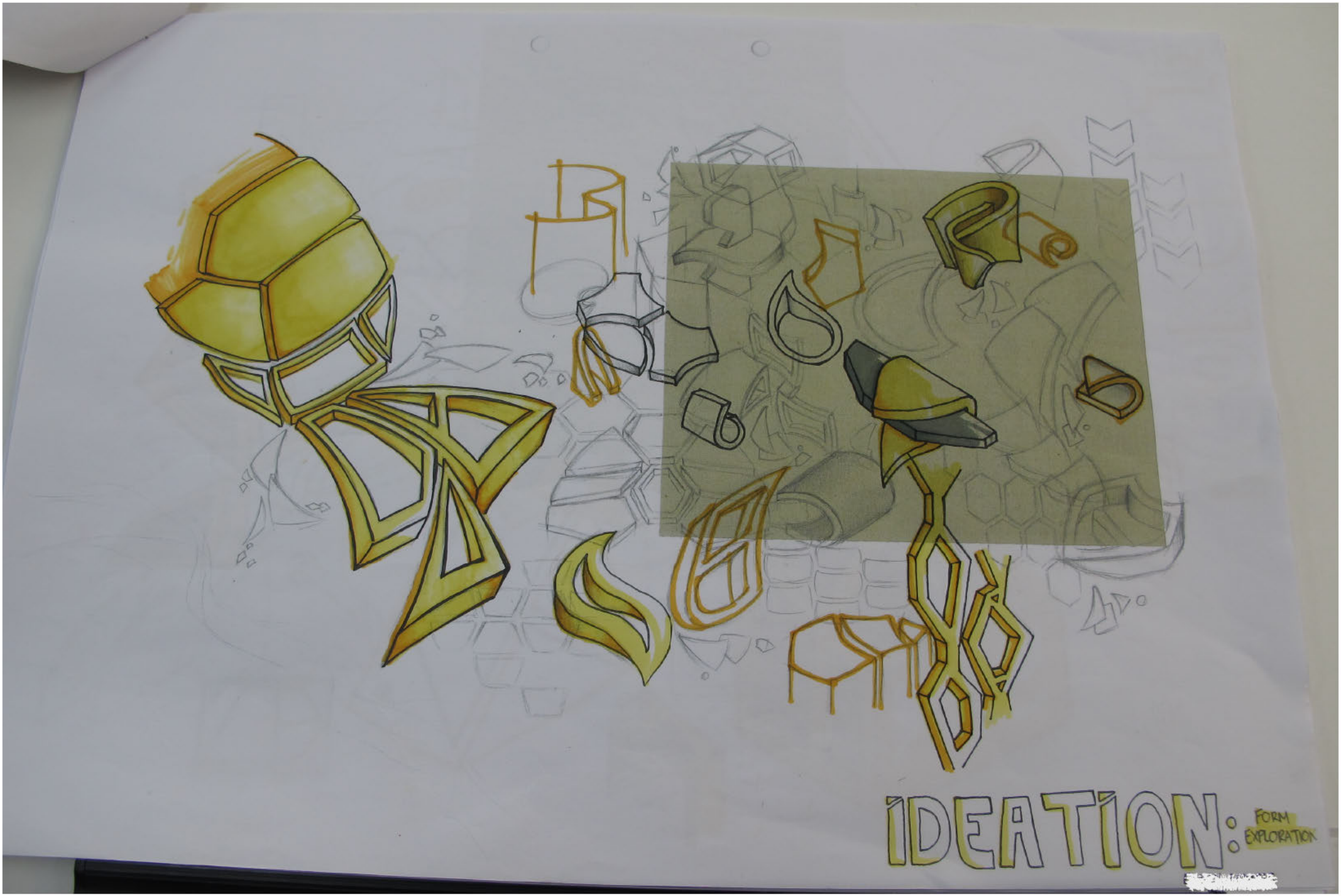
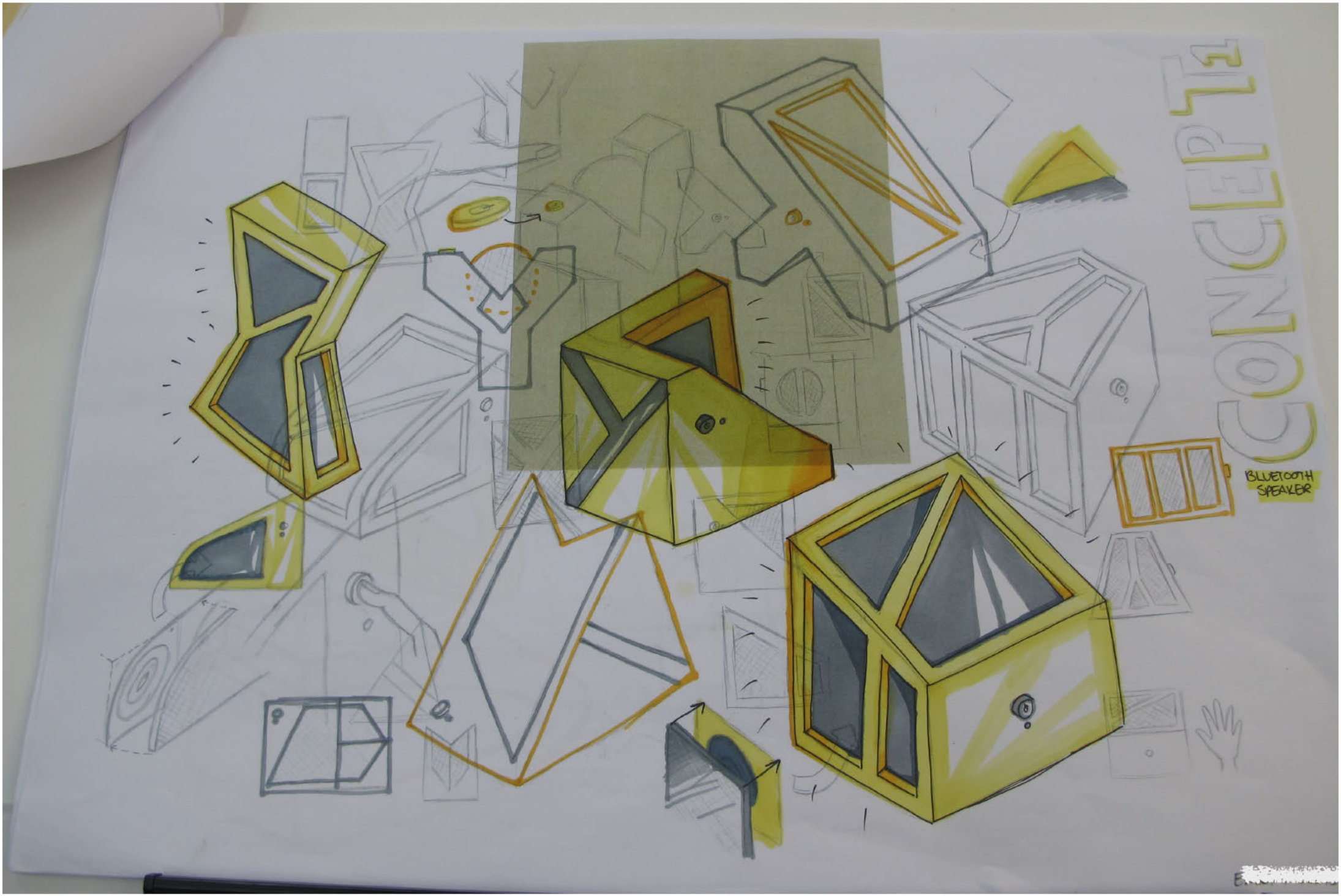
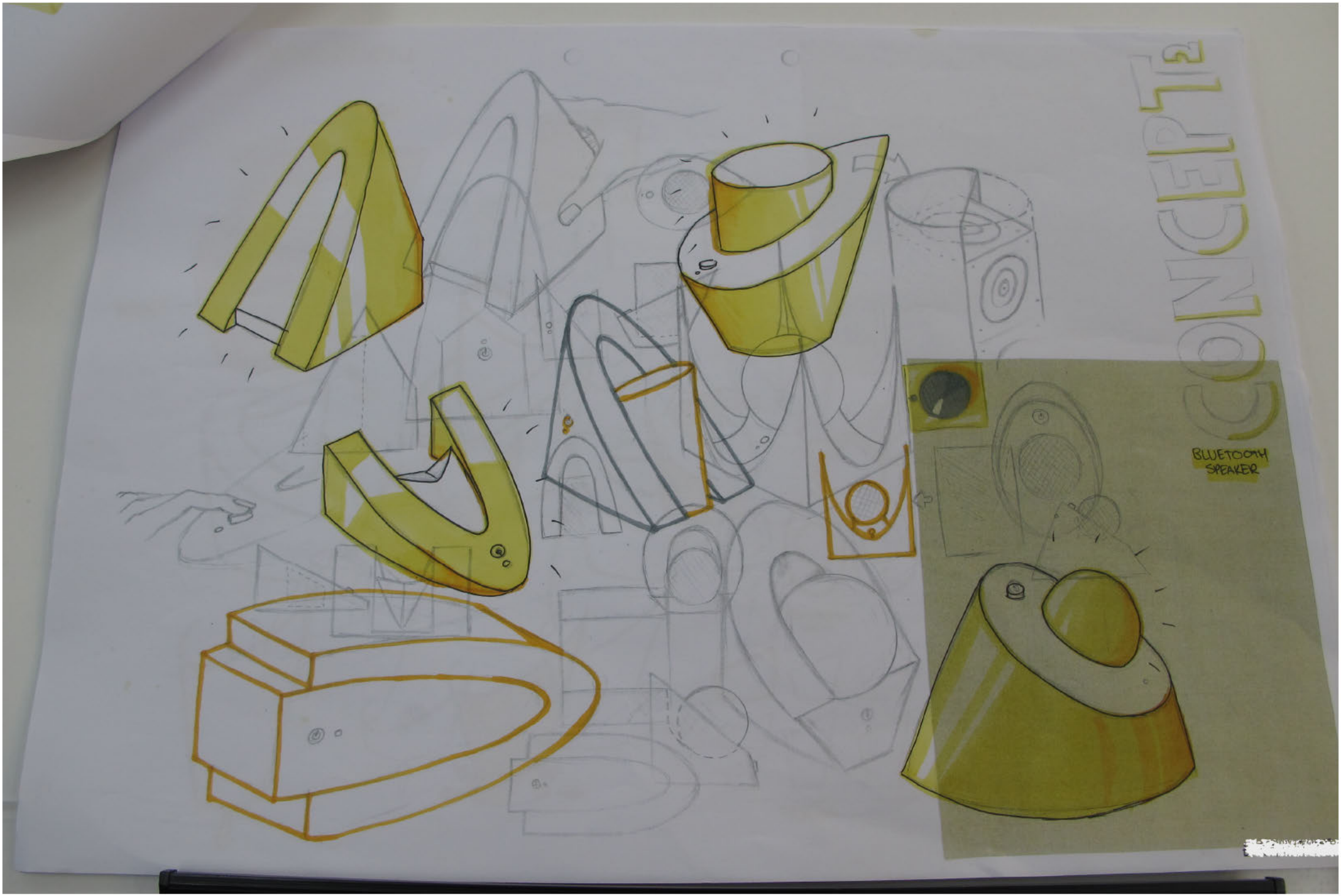
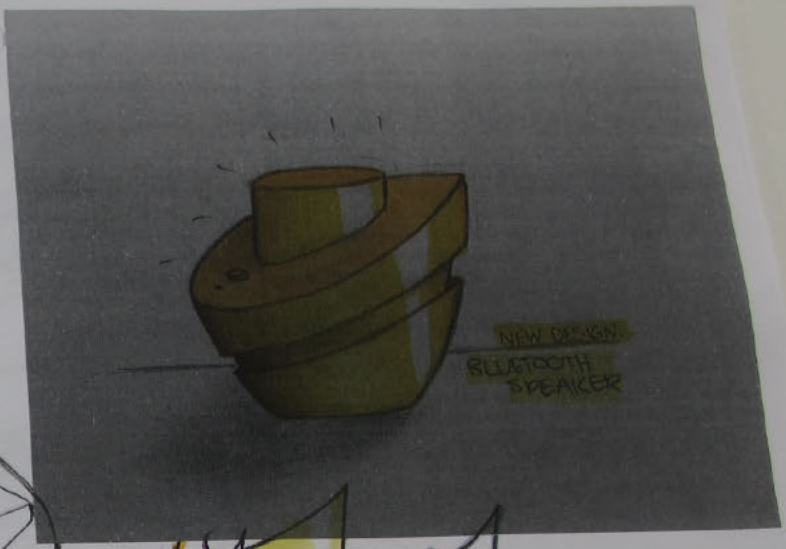
IDEATION: SEA TURTLE

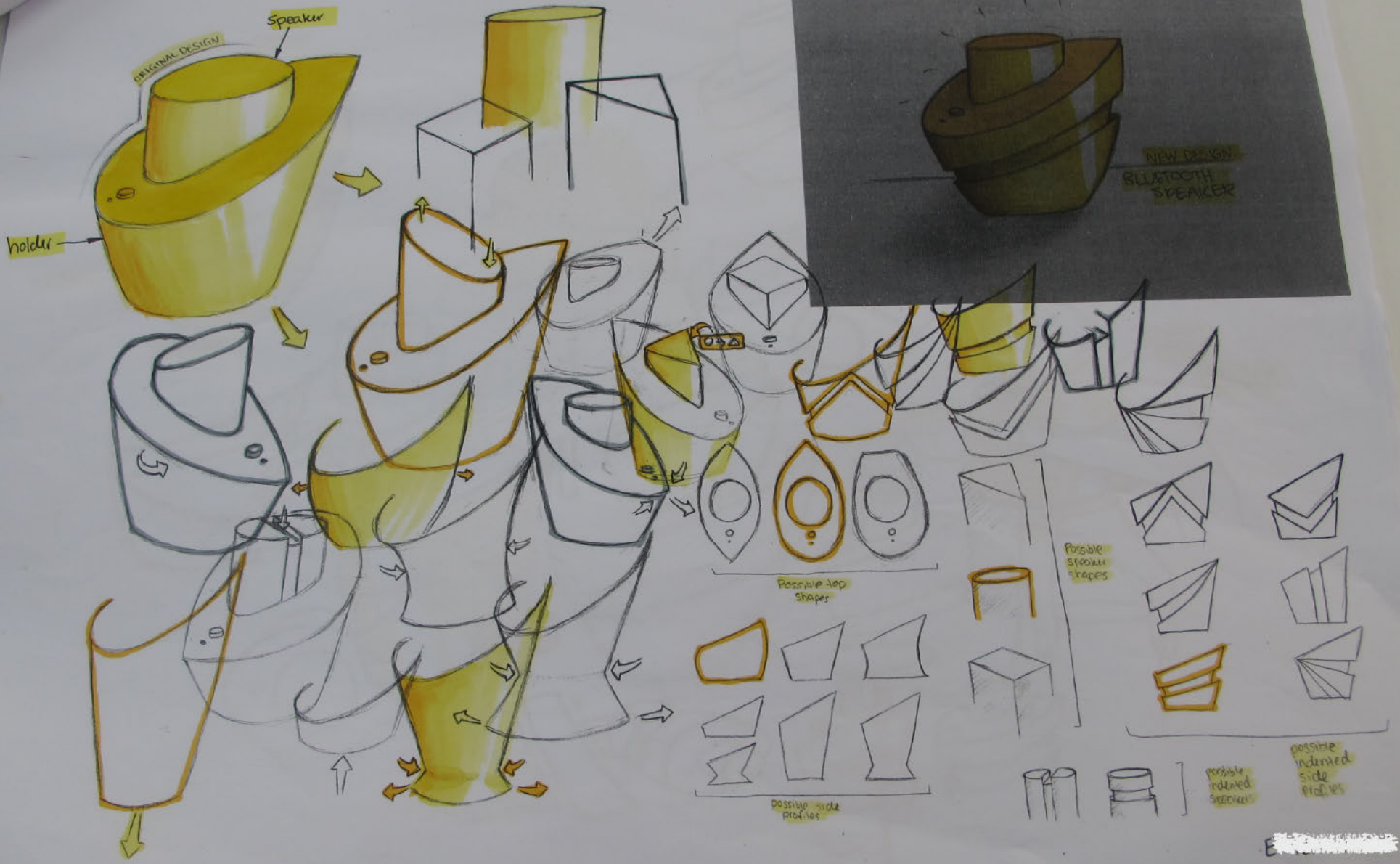

IDEATION:
FORM
EXPLORATION

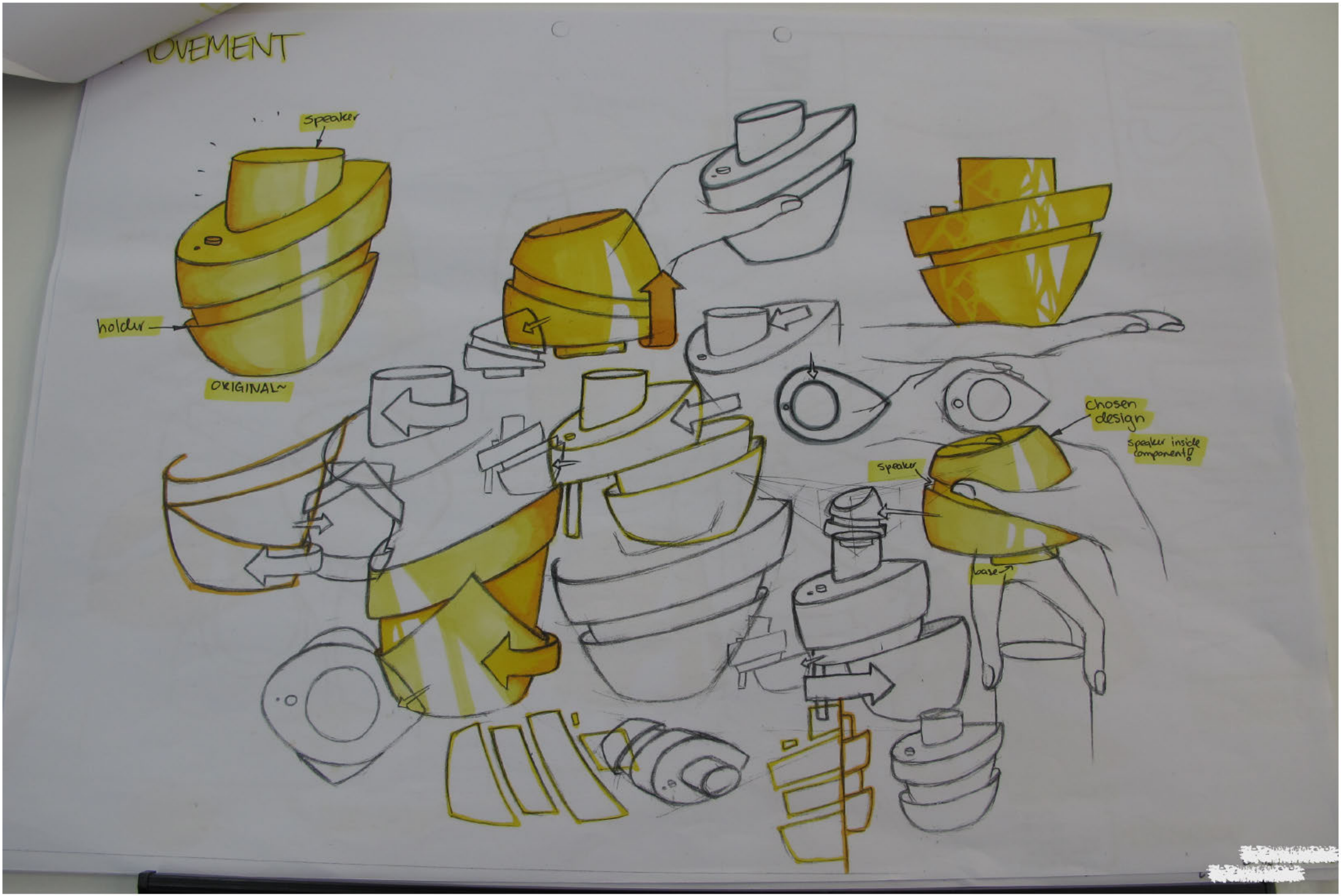

CONCEPT
BLUETOOTH
SPEAKER


CONCEPTS
BLUETOOTH SPEAKER

RM + PROPORTION



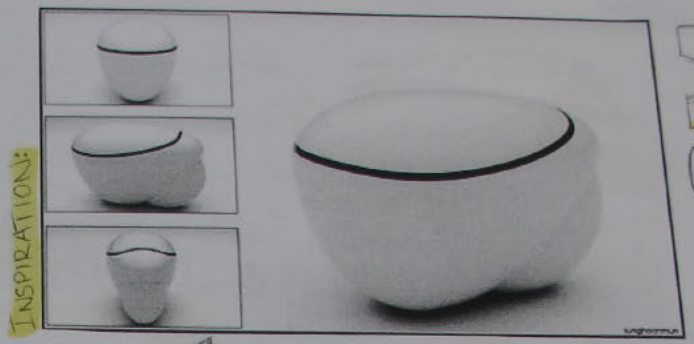



OVEMENT
speaker
holder
ORIGINAL~
Chosen design
speaker inside component?
speaker
base

MINIMALISM

EXPLORATION & DEVELOPMENT

INSPIRATION:



ORIGINAL~

speaker

cover component

base

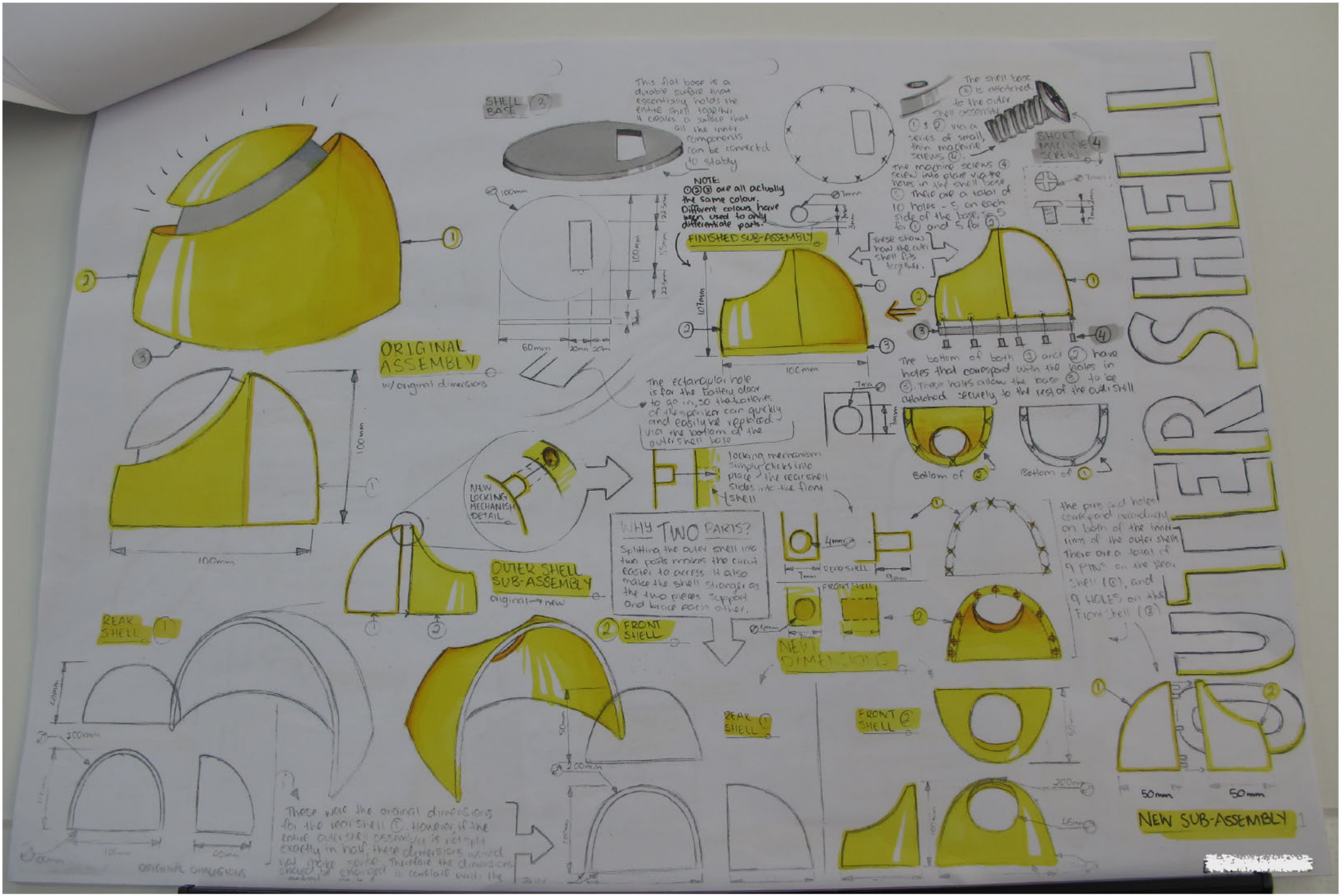
VERSUS

speaker

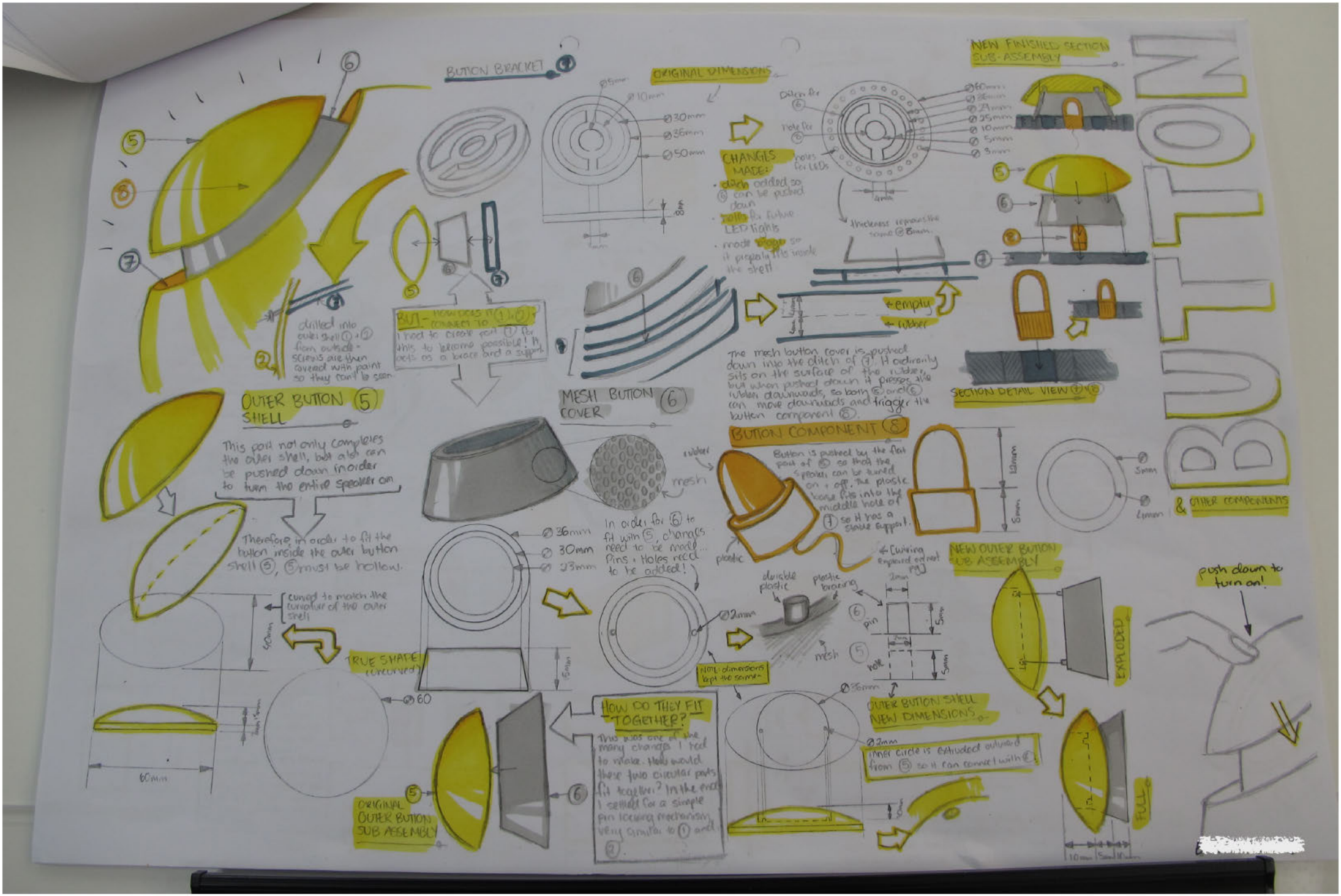
NEW DESIGN!

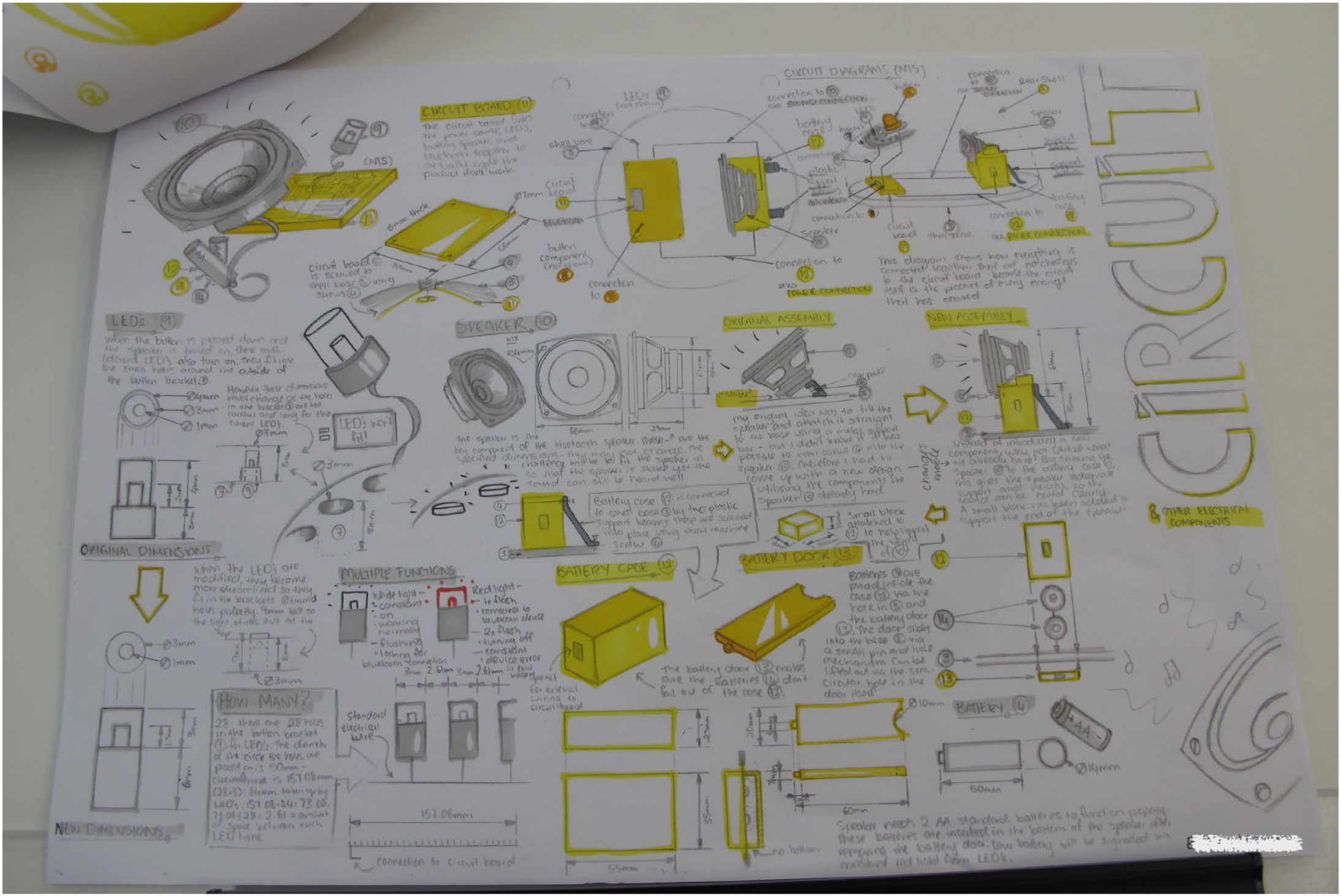
- less parts
  - no base
  - no button - top acts as button
  - simpler shape

→ MINIMALISM



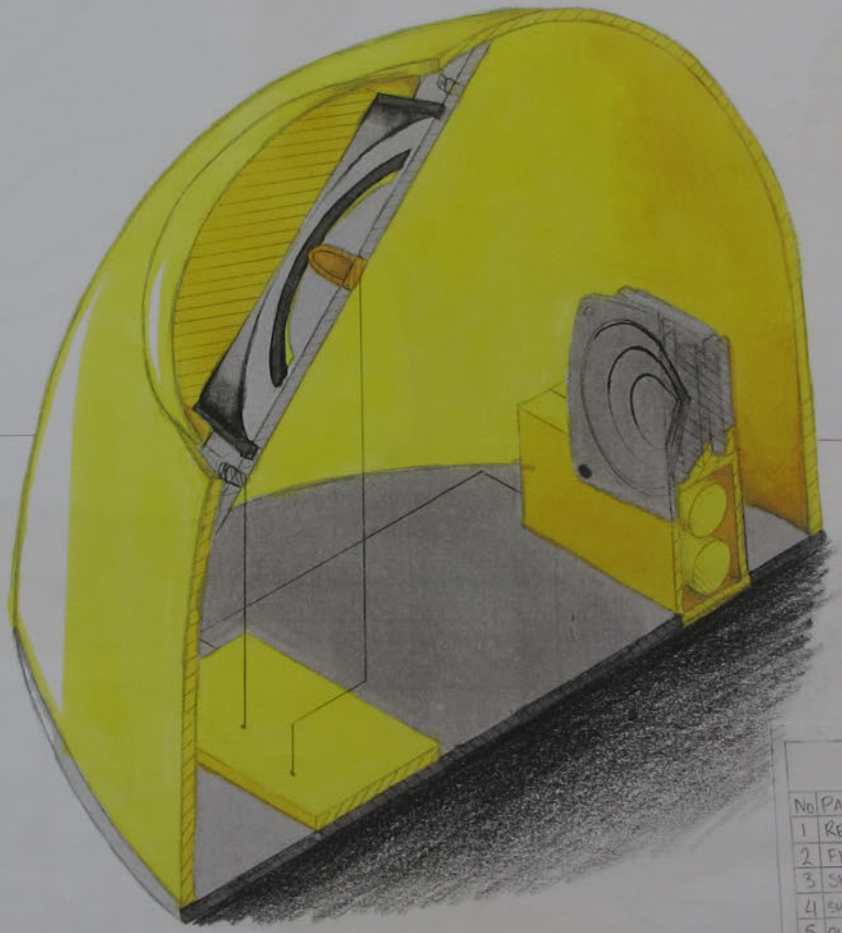
SHELL BASE 3
This flat base is a durable surface that essentially holds the entire shell together. It creates a surface that all the inner components can be connected to stably.
NOTE: ①②③ are all actually the same colour. Different colours have been used to only differentiate parts.
The shell base ③ is attached to the outer shell assembly ① & ② via a series of small, thin machine screws ④.
SHORT MACHINE SCREW 4
The machine screws ④ screw into place via the holes in the shell base ③. There are a total of 10 holes - 5 on each side of the base, so 5 for ① and 5 for ②.
FINISHED SUB-ASSEMBLY
These show how the outer shell fits together.
The bottom of both ① and ② have holes that correspond with the holes in ③. These holes allow the base ③ to be attached securely to the rest of the outer shell
ORIGINAL ASSEMBLY
w/ original dimensions
The ectangular hole is for the battery door to go in, so the batteries of the speaker can quickly and easily be replaced via the bottom of the outer shell base
Bottom of ②
Bottom of ①
NEW LOCKING MECHANISM DETAIL
locking mechanism simply clicks into place - the rear shell slides into the front shell
WHY TWO PARTS?
Splitting the outer shell into two parts makes the circuit easier to access. It also make the shell stronger as the two pieces support and brace each other.
OUTER SHELL SUB-ASSEMBLY
original → new
REAR SHELL
FRONT SHELL
NEW DIMENSIONS
the pins and holes correspond accordingly on both of the inner rims of the outer shells. There are a total of 9 PINS on the rear shell (①), and 9 HOLES on the front shell (②)
REAR SHELL 1
2 FRONT SHELL
REAR SHELL 1
FRONT SHELL 2
These were the original dimensions for the rear shell ①. However, if the entire outer shell assembly is not split exactly in half, these dimensions would not make sense. Therefore the dimensions should be changed to correlate with the
ORIGINAL DIMENSIONS
50mm
50mm
NEW SUB-ASSEMBLY
OUTER SHELL


BUTTON
BUTTON BRACKET
ORIGINAL DIMENSIONS
NEW FINISHED SECTION SUB-ASSEMBLY
CHANGES MADE:
ditch added so ⑥ can be pushed down
holes for future LED lights
made bigger so it properly fits inside the shell
thickness remains the same @ 8mm
drilled into outer shell ① + ② from outside - screws are then covered with paint so they can't be seen
BUT - HOW DOES IT CONNECT TO ① + ②?
I had to create part ⑦ for this to become possible! It acts as a brace and a support.
empty
rubber
The mesh button cover is pushed down into the ditch of ⑦. It ordinarily sits on the surface of the rubber, but when pushed down it presses the rubber downwards, so both ⑤ and ⑥ can move downwards and trigger the button component ⑧.
SECTION DETAIL VIEW ⑦ + ⑧
OUTER BUTTON SHELL ⑤
This part not only completes the outer shell, but also can be pushed down in order to turn the entire speaker on
Therefore, in order to fit the button inside the outer button shell ⑤, ⑤ must be hollow.
MESH BUTTON COVER ⑥
rubber
mesh
BUTTON COMPONENT ⑧
Button is pushed by the flat part of ⑧ so that the speaker can be turned on + off. The plastic base fits into the middle hole of ⑦ so it has a stable support.
plastic
& OTHER COMPONENTS
In order for ⑥ to fit with ⑤, changes need to be made... Pins + Holes need to be added!
curved to match the curvature of the outer shell
TRUE SHAPE (uncurved)
NOTE: dimensions kept the same
NEW OUTER BUTTON SUB ASSEMBLY
EXPLODED
push down to turn on!
OUTER BUTTON SHELL NEW DIMENSIONS
inner circle is extruded outward from ⑤ so it can connect with ⑥
HOW DO THEY FIT TOGETHER?
This was one of the many changes I had to make. How would these two circular parts fit together? In the end I settled for a simple pin locking mechanism very similar to ① and ②.
ORIGINAL OUTER BUTTON SUB ASSEMBLY
FULL


CIRCUIT
CIRCUIT BOARD (11)
The circuit board links the power source, LEDs, button, speaker, and bluetooth together to actually make the product itself work.
CIRCUIT DIAGRAMS (NTS)
This diagram shows how everything is connected together. There are no changes to the circuit board because the circuit itself is the product of every change that has occured.
LEDs (9)
When the button is pressed down and the speaker is turned on, these multi-coloured LED's also turn on. They fit into the small holes around the outside of the button bracket (7).
However these dimensions must change as the holes in the bracket (7) are too narrow and long for the current LED's.
LED's won't fit!
SPEAKER (10)
The speaker is the key component of the bluetooth speaker. These are the specified dimensions - they may not change. The challenge will be to fit the speaker in so that the speaker is stable yet the sound can still be heard well.
ORIGINAL ASSEMBLY
My original idea was to tilt the speaker and attach it straight to the base using a metal support bar - but I didn't know if it was possible to wear screw (4) into the speaker (10). Therefore I had to come up with a new design utilising the components the speaker (10) already had.
NEW ASSEMBLY
Instead of introducing a new component, why not utilize what we already have? By screwing the speaker (10) to the battery case (12), this gives the speaker adequate support and height, so the sound can be heard clearly. A small block has been added to support the end of the speaker.
changes made
Battery case (12) is connected to shell base (3) by two plastic support beams. These are screwed into place using short machine screw (4).
Small block attached to (12) to help support the weight of (10).
& OTHER ELECTRICAL COMPONENTS
ORIGINAL DIMENSIONS
When the LED's are modified, they become more streamlined so they fit in the brackets. Ø3mm holes perfectly. 9mm tall so the light sticks out at the top.
MULTIPLE FUNCTIONS
White light - constant - on - working normally - flashing - looking for bluetooth connection
Red light - 1x flash - connected to bluetooth device - 2x flash - turning off - constant - device error or low battery
BATTERY CASE (12)
The battery door (13) makes sure the batteries (14) don't fall out of the case (12).
BATTERY DOOR (13)
Batteries (14) are placed inside the case (12) via the hole in (3) and the battery door (13). The door slides into the base (3) via a small pin and hole mechanism. Can be lifted out via the semi-circular hole in the door itself.
HOW MANY?
28 - there are 28 holes in the button bracket (7) for LED's. The diameter of the circle the holes are placed on is 50mm - circumference is 157.08mm (28x3): 84mm taken up by LED's, 157.08-84: 73.08, 73.08÷28: 2.61 = amount of space between each LED light.
Standard electrical wire
157.08mm
connection to circuit board
NEW DIMENSIONS
BATTERY (14)
Speaker needs 2 AA standard batteries to function properly. These batteries are inserted in the bottom of the speaker after removing the battery door. Low battery will be signalled via constant red light from LED's.

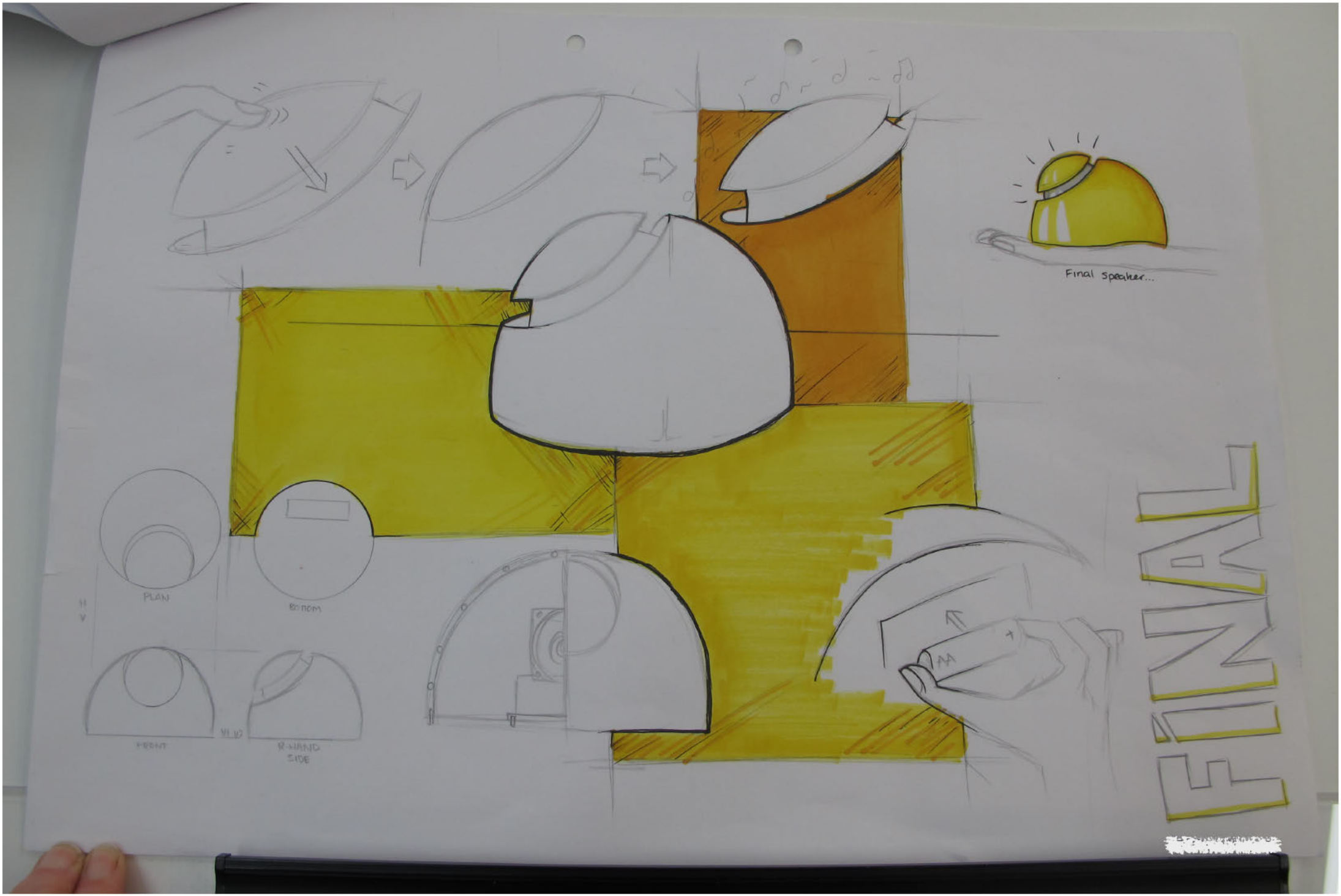
SECTION

SHOWING ALL THE DIFFERENT PARTS
(1) → (14)



PARTS LIST

No	PART NAME	Qty	MATERIAL
1	REAR SHELL	1	yellow plastic
2	FRONT SHELL	1	yellow plastic
3	SHELL BASE	1	re-inforced yellow plastic
4	SHORT MACHINE SCREW	20	iron
5	OUTER BUTTON SHELL	1	yellow plastic
6	MESH BUTTON COVER	1	grey mesh
7	BUTTON BRACKET	1	re-inforced grey plastic
8	BUTTON COMPONENT	1	rubber + plastic
9	LEDs	28	plastic + electrical components
10	SPEAKER	1	plastic + electrical components
11	CIRCUIT BOARD	1	plastic + electrical components
12	BATTERY CASE	1	grey plastic
13	BATTERY DOOR	1	grey plastic
14	AA BATTERIES	2	metal


Final Speaker...
PLAN
FRONT
R-HAND SIDE
FINAL

MERIT
PRODUCT : SPEAKER

12 pages in total

AS 91627 (3.30): Initiate design ideas through exploration (4 credits)

Achievement	Achievement with Merit	Achievement with Excellence	Overall level of attainment for 91627
Initiate design ideas through exploration.	Initiate design ideas through insightful exploration.	Initiate design ideas through extensive exploration.	M
• Use starting experiences and visual communication strategies to **explore alternatives** and **variations** to **expand design thinking**. • Ideas are **re-generated** from alternatives and variations which **lead towards** design ideas.	• Use visual communication strategies to show **considered** alternatives and variations for the purpose of **analysing and re-interpreting** ideas. • Ideas identify an **emerging train of thought** that **informs** design ideas.	• Use visual communication strategies to show **divergent and perceptive** alternatives and variations. • Train of thought ideas **extend and transform** design ideas.	

Pages 1- 3 outline a starting point from imagery of a sea turtle and its shell. They show simple but focused exploration and thinking to form shapes and variations that regenerate towards product design ideas of a potential speaker by page 3.

Pages 4 - 7 show re-generation and reorganisation of design elements. By using visual communication strategies of inverse and scale, new reformed variations of speaker design ideas are explored. The introduction of a secondary inspiration point of minimalism on page 7, brings in new focused informed knowledge.

Pages 8 - 12 further explore and reveal considered analysis, and informed ideas that emerge over the sequence with detail, clear train of thought, and re-interpretation of the design.

This submission is a Merit as the speaker does not transform or extend in any divergent way beyond the re-interpreted design ideas. A range of visual communication strategies combined with sketching and rendering to covey the thinking around the product design ideas is used in an effective manner.