The background is a textured, light brown surface. It is decorated with various mechanical icons: large grey gears in the top-left and bottom-right corners, and a complex network of brown and orange pipes and smaller gears on the left and right sides. The main title is centered in a large, bold, dark brown font.

REVERSE ENGINEERING

Presented by Middle School Marcelline Robotics 20315B
(Hannah Z., Ariane N., Alissa R., Aleksya C., Jessica C.,
Carelle A.)

THE CHOSEN ITEM

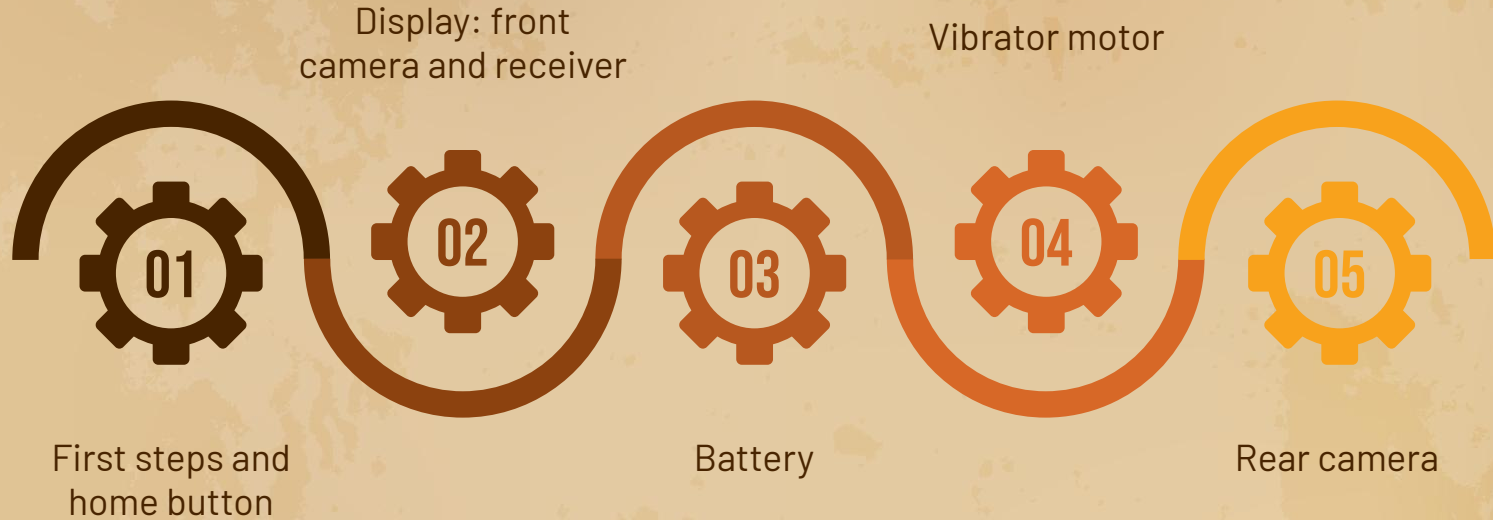
AKA the chosen one...!

Why did we decide to choose this item specifically?

In our daily life, phones are always a significant and useful electronic device to help us communicate, access information, take photos, etc. In order to identify the functions of different parts of a phone, we will be doing reverse engineering. Main functions of **principal components** of an Iphone 6 plus, **lessons learned** and **findings discovered** can be found in this report.



SUMMARY



FIRST STEPS OF DECONSTRUCTING A PHONE (AKA BREAKING AND DESTROYING... 🛠️)

A PHONE

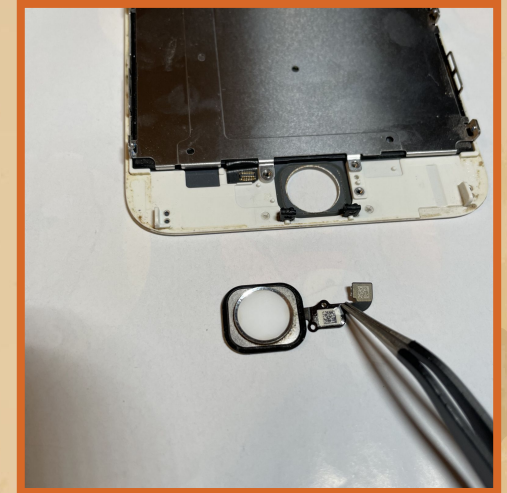
First of all, by unscrewing the **two pentalobe screws** situated at the bottom of the phone and by lifting the display with a **suction cup** as well as picking it up, we can see the overwhelming majority of **all the components**.



Tools ↑

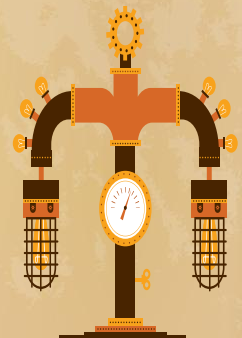
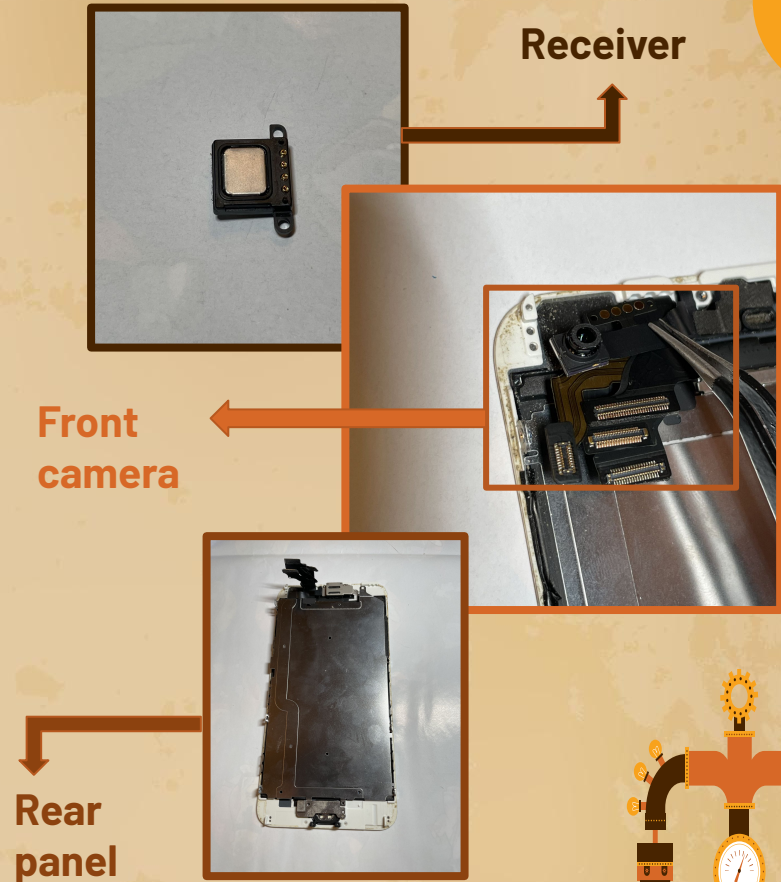
HOME BUTTON

Afterwards, we can easily pop out the **home button** after disconnecting it and removing the metal cover. The home button has the Touch ID fingerprint scanner made for making purchases or unlocking the phone. Additionally, it is an area that is frequently used because it is the **main controller** of the phone due to its multiple functions such as unlocking the phone, switching between apps, taking screenshots, etc .



DISPLAY

Secondly, we can find the **receiver** and the **front camera** on the display. The receiver serves as an ear speaker, it emits sounds while calling. Following that, there is the **rear panel**. It routes the cable of the home button and the lightning port to the logic board by hiding them under.



BATTERY

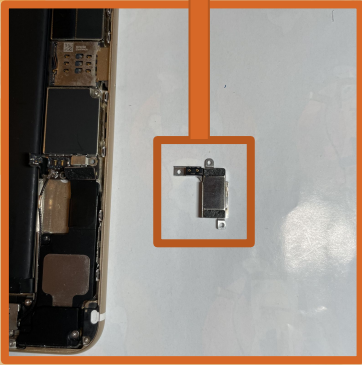
Battery



Moving forward to other important components situated beside the logic board, one of those being the **battery**. The battery is the **energy source** of the system. It stores and releases electrical energy when needed. iPhone batteries use **lithium-ion technology** giving it a plethora of advantages, such as: bigger capacity and longer lasting employment and battery life. Those criterias improve the battery performance which can make the phone's lifespan sustain longer.

VIBRATOR MOTOR

YES, IT VIBRATES!



We discovered a very interesting component located on the right side of the battery: the **vibrator motor**. We found it exceptionally enthralling due to its small size, its impactful vibration as well as its strong effect on the whole phone while receiving notifications. The vibrator is composed of **three different layers**: the casing, two layers of copper coils and the permanent magnets.



THREE LAYERS

The **casing** is a metal plate that maintains all the layers together and it transfers the vibration to the phone body.

1

In the second layer and the fourth layer, the **copper coils** are connected to the electricity. Within the two layers, electricity passes through the coils, creating a magnetic field in which positive and negative charges are generated with opposite polarities.

2

The **magnets** of the third layer move back and forth due to the pushing done by the magnetic field, which creates a vibration up to 60 times per second (WOW!!!).

3

REAR CAMERA

A lot of people have shaky hands...

Furthermore, have you ever noticed that when you take pictures, your phone is slightly shaking because of your hands? Have you ever wondered why your photos are still **clear** and **high quality**?

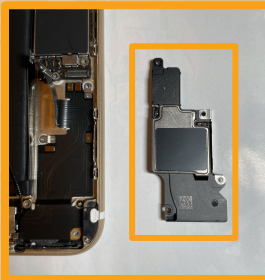
Well, by removing the metal cover, we explored the **rear camera**. There is a very interesting design situated in the camera; **the optical image stabilization**. Around the camera, there are multiple sensors surrounded by electromagnetic coils, which attract each other gently to keep a certain level of **stabilization** while taking pictures.

Rear
camera

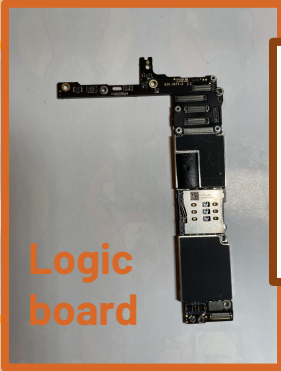


OTHER COMPONENTS

speaker



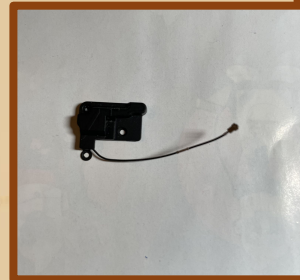
Logic board



Volume buttons



antenna



Lightning connector



Finally, there are still a few other components that serve a role in a phone like: the speaker, the logic board, the volume buttons, the antennas and the lightning connector.

WHAT WE LEARNED FROM THIS EXPERIENCE

ARIANE N.

The phone is a very intricate tool that took a lot of time to coordinate all of the engineering

ALEKSYA C.

This gave us the opportunity to explore how the design, the manufacturing and the engineering of a phone are spectacular

JESSICA C.

The phone is a daily tool that is used by us and that isn't appreciated, amazed and recognized enough

HANNAH Z.

I learned that electrical wires that connect the components to the logic board are all well routed

CARELLE A.

I discovered that every elements that compose a phone all had a particular role in the functioning of a phone

ALISSA R.

I recognized that the design of the phone is particularly compact and well thought out for its daily use. It is a tool that is very attentive to detail

THANK YOU!

CREDITS:

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CREDITS: This presentation template was created by **Slidesgo**, including icons by **Flaticon**, infographics & images by **Freepik** and illustrations by **Stories**

RESOURCES

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- [HTTPS://WWW.IDOC.EU/GUIDES/EN/APPLE/IPHONE-6-PLUS/TEARDOWN/147](https://www.idoc.eu/guides/en/apple/iphone-6-plus/teardown/147)
- [HTTPS://WWW.LIFEWIRE.COM/IPHONE-6-SERIES-BUTTONS-4103839#:~:TEXT=HOME%20BUTTON,BECAUSE%20IT'S%20USED&TEXT=THE%20IPHONE%206%20HOME%20BUTTON,AND%20MAKING%20PURCHASES%20WITH%20APPLEPAY.](https://www.lifewire.com/iphone-6-series-buttons-4103839#:~:text=home%20button,because%20it's%20used&text=the%20iphone%206%20home%20button,and%20making%20purchases%20with%20applepay.)
- [HTTPS://WWW.TECHINSIGHTS.COM/BLOG/APPLE-IPHONE-6-AND-IPHONE-6-PLUS-TEARDOWN](https://www.techinsights.com/blog/apple-iphone-6-and-iphone-6-plus-teardown)
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