



**iPhone 4**

**iPhone 4s**

# Apple Recycler Guide

June 2023

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# About This Guide

Apple Recycler Guides provide guidance for electronics recyclers on how to disassemble products to maximize recovery of resources. The guides provide step-by-step disassembly instructions and information on the material composition to help recyclers direct fractions to the appropriate material recycler.

To conserve important resources, we work to reduce the materials we use and aim to one day source only recycled or renewable materials in our products. A key path to reaching that goal is resource recovery from end-of-life electronics.

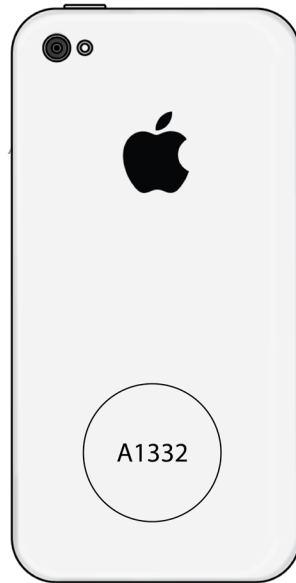
Disassembly procedures are intended to be performed only by trained electronics recycling professionals. The recycler is responsible for independently evaluating and ensuring compliance with all applicable environmental, health, and safety laws related to the work. These include but are not limited to laws relating to the management, handling, shipping, and disposal of the outputs of this work as waste and laws in place to ensure the health and safety of all employees who support this work.

For questions or feedback about this guide, email [contactesci@apple.com](mailto:contactesci@apple.com).

**Note:** This guide may show images from other similar models, but the procedures are the same.

# Identification

You can find the model number on the back of the iPhone.



*Model numbers:*

*A1332, A1349, A1387, A1431*

# Directive 2012/19/EU Annex VII Components

Directive 2012/19/EU Annex VII requirements apply to the following substances and components.

<b>Substance/Component</b>	<b>Apple Part Name</b>	<b>Removal Instructions</b>
Printed circuit board if the surface is greater than 10 square centimeters	Main logic board	Follow steps 1–8
External electric cables	Power adapter, charge cable	Follow step 1
Battery	Lithium-ion polymer battery	Follow steps 1–3
Cover glass and liquid crystal display (LCD) cell if the surface is greater than 100 square centimeters	LCD cell	Follow steps 1–19
No further substances or components as listed in Annex VII		

# Safety Considerations

The recycler is responsible for independently evaluating all activities undertaken by its employees to perform or support the work and ensuring compliance with all applicable health and safety laws related to the work. These include but are not limited to laws relating to the health and safety of all employees who perform or support this work. The recycler is also responsible for evaluating the workspace and ensuring that the area in which the work is to be undertaken is designed using ergonomic best practices and meets all ergonomic requirements to ensure the protection of its employees.

## Personal Protective Equipment

Personal protective equipment should be worn during the entire recycling process.



Wear hand protection



Wear protective clothing



Wear eye protection



Wear foot protection

## Battery Safety

This product uses a lithium-ion polymer battery. Before beginning any disassembly work, ensure that a safe working procedure for handling lithium-ion batteries has been established, which could include discharging the batteries so that they can be more safely managed. The following considerations may also be included:

- Remove anything from your person that could conduct energy, such as jewelry and watches, to avoid electric shock to yourself or the logic board.
- To avoid the potential for thermal runaway and the release of potentially noxious fumes, don't puncture, strike, or crush lithium-ion polymer batteries or devices powered by them.
- Don't throw, drop, or bend the battery.
- Don't expose the battery to excessive heat or sunlight.
- Don't use tools that are sharp or conduct electricity.
- Keep your workspace clear of foreign objects and sharp materials.
- Dispose of batteries according to local environmental laws and guidelines.

## Workspace safety guidelines

- Use heat-resistant gloves and safety glasses.
- Keep a sand dispenser within arm's reach (2 feet or 0.6 m) on one side of the workstation, not above the workstation. The dispenser should be a wide-mouthed, quick-pour metal container with a flip-top lid or tray that contains 8–10 cups (1.9–2.4 L) of clean, dry, untreated sand.
- Keep the battery at least 2 feet (0.6 m) from paper and other combustible materials.
- Work in an area with adequate ventilation.

## Handling a thermal runaway

If you notice any of the following signs, a thermal runaway is likely underway, and you should act immediately:

- The lithium-ion polymer battery or a device containing one begins to smoke or emit sparks or soot.
- The battery pouch suddenly and quickly puffs out.
- You hear hissing or popping sounds.

**Don't** use water or an ABC/CO<sub>2</sub> fire extinguisher on a thermal runaway battery or a device containing one. Water and ABC/CO<sub>2</sub> fire extinguishers will not stop the reaction.

**Do** smother the battery or device immediately with plenty of clean, dry sand, dumped all at once. Timing is critical; the faster you pour all the sand, the faster the thermal runaway will stop.

**Do** leave the room for 30 minutes if the thermal runaway causes any irritation.

**Do** wait 30 minutes before touching the battery. Wear heat-resistant gloves and safety glasses to remove the battery from the sand, or use a touchless thermometer to measure the battery temperature. Only touch the battery when the event has finished.

**Do** dispose of the damaged battery or device (including any debris removed from the sand) according to local environmental laws and guidelines.

## Hazard Warnings



Broken glass hazard



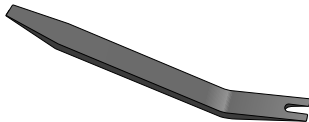
Chemical exposure hazard



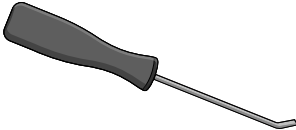
Rechargeable battery hazard

# Recommended Tools

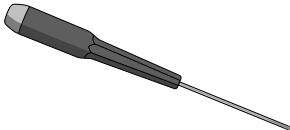
Miniature plastic pry bar



Miniature pry bar



Precision slotted screwdriver

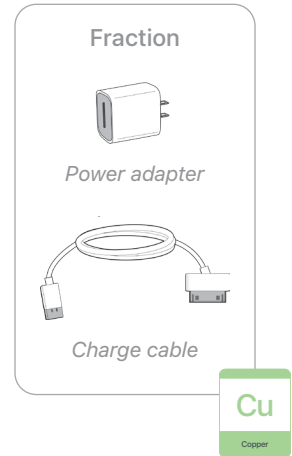
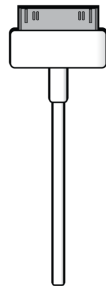
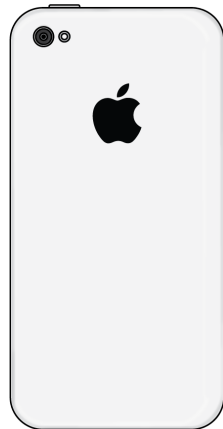




# Disassembly Instructions

## 1. Remove the power adapter and the charge cable.

- » *Ensure that the iPhone is turned off.*
- » *Unplug the power adapter. Disconnect both ends of the charge cable.*

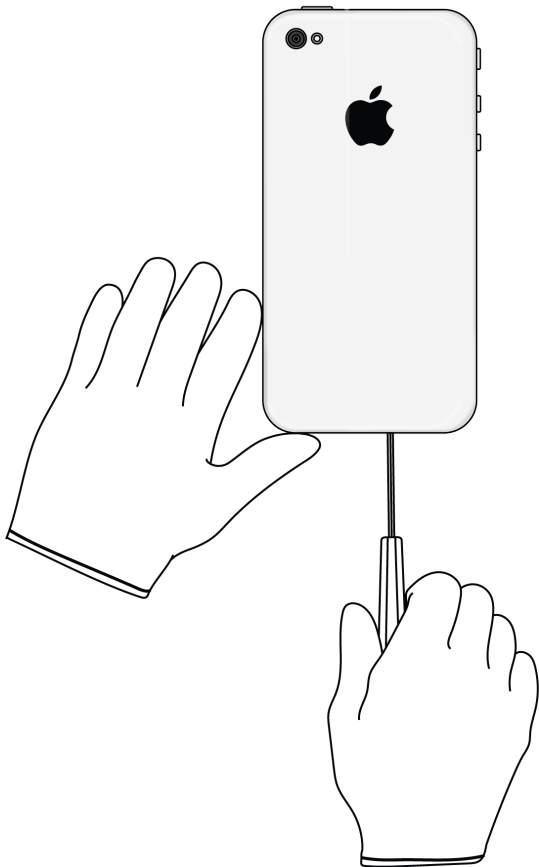


## 2. Remove the back panel.

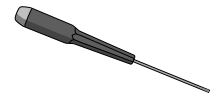


Broken glass hazard

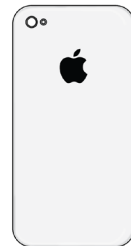
- » Lay the iPhone facedown.
- » Insert the tool tip between the back panel and the enclosure. Pry off the back panel.



### Tools Used




### Fraction

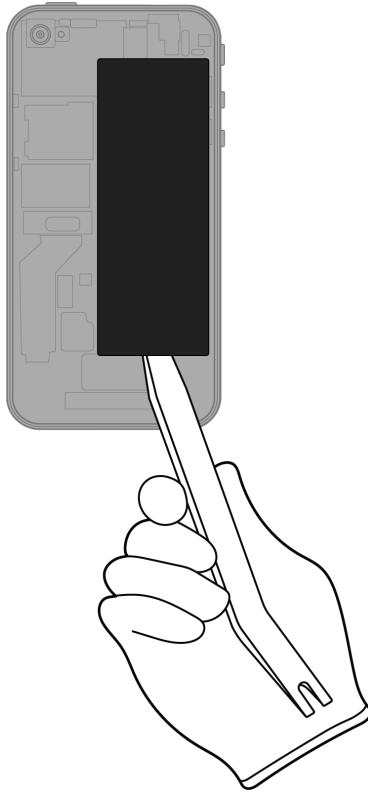


Back panel

GL  
Glass

3. By hand, carefully remove the lithium-ion polymer battery by gently pulling up on the tab. Continue with the miniature plastic pry bar if needed.


 Rechargeable battery hazard



Tools Used



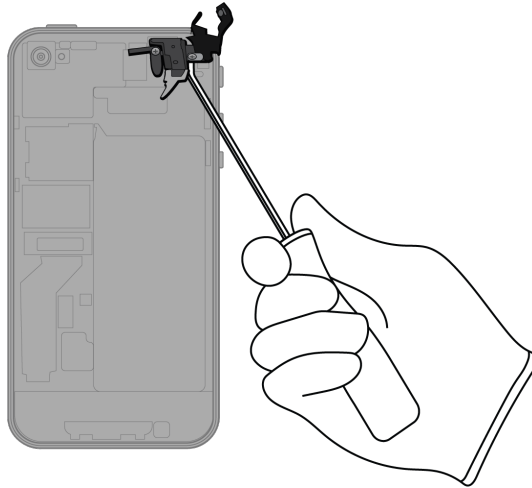
Fraction



Lithium-ion polymer battery

BT  
Battery

4. Pry off the headphone jack.



Tools Used



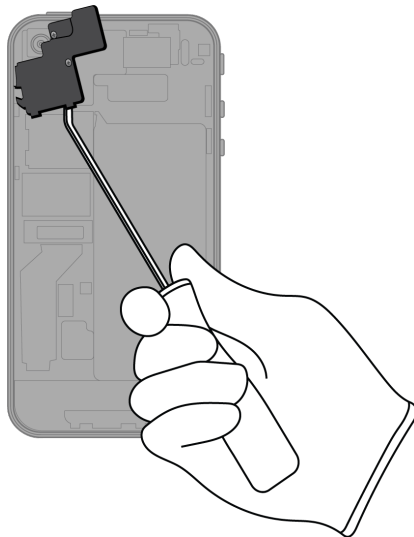
Fraction



Headphone jack

Cu  
Copper

5. Pry off the main logic board cover.



Tools Used



Fraction



Main logic board cover

Fe  
Ferrous

6. Pry off the rear camera.



Tools Used



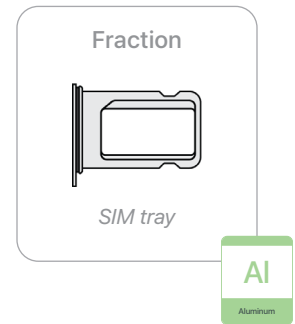
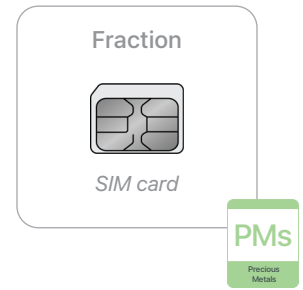
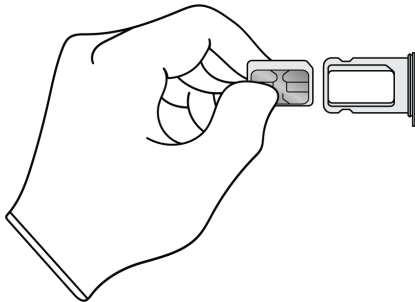
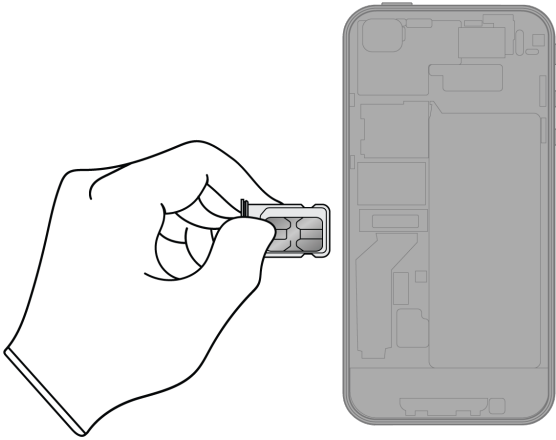
Fraction



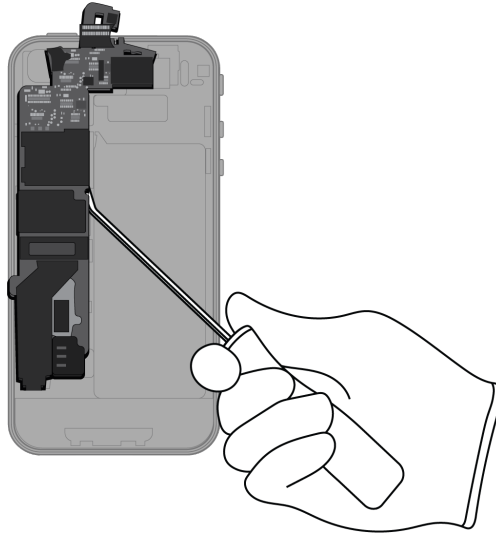
Rear camera



7. Remove the SIM tray. Separate the SIM card from the SIM tray.



8. Pry the main logic board off the enclosure.



Tools Used



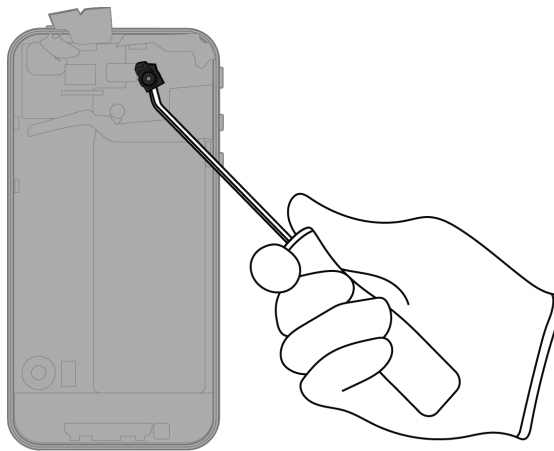
Fraction



Main logic board



9. Pry off the front camera.



Tools Used



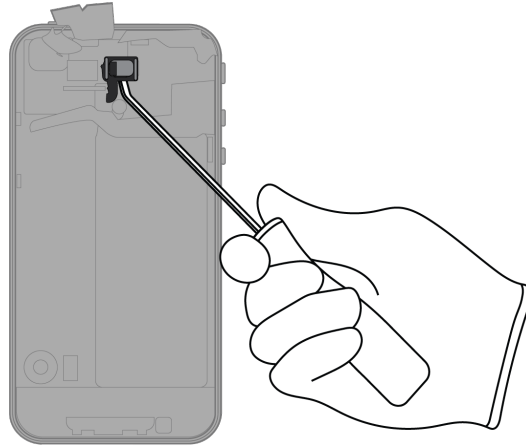
Fraction



Front camera



**10.** Pry off the receiver.



Tools Used



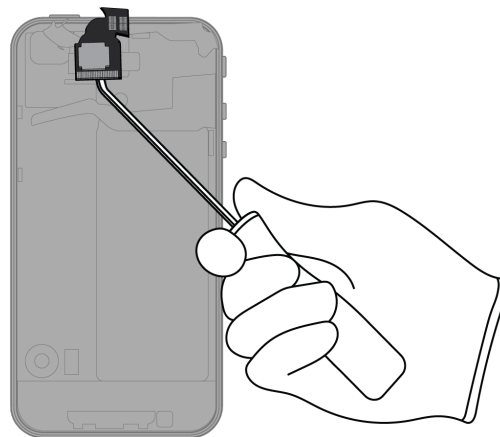
Fraction



Receiver

**REE**  
Rare Earth  
Elements

**11.** Pry off the receiver ribbon cable.



Tools Used



Fraction

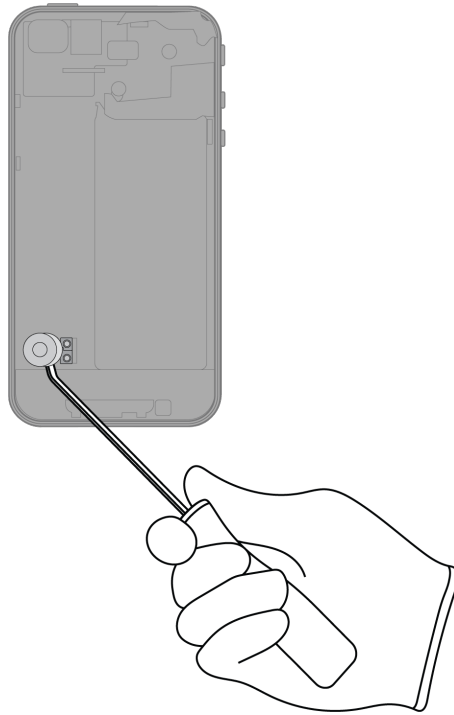


Ribbon cable

**Cu**  
Copper



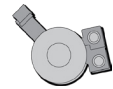
## 12. Pry off the vibration motor.



### Tools Used



### Fraction

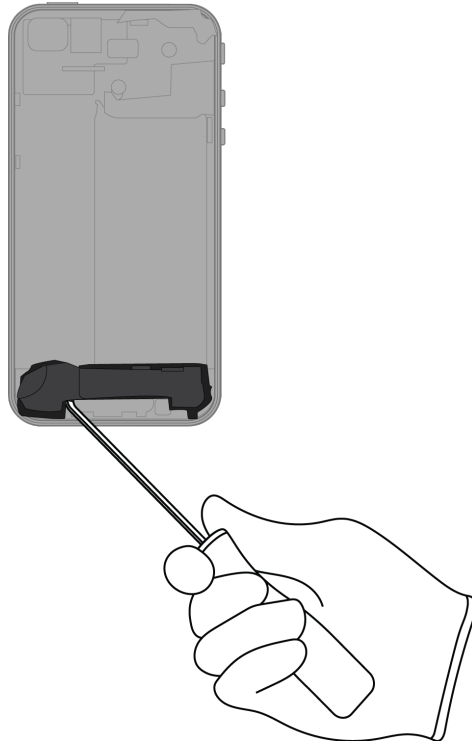


Vibration motor

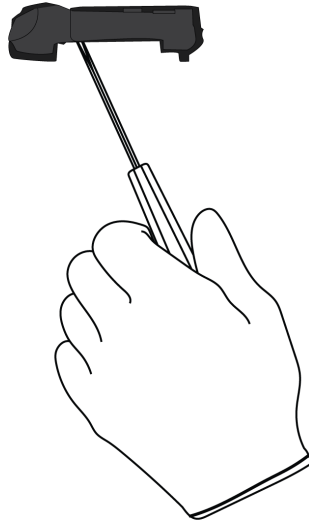
Cu  
Copper

**13.** Pry off the speaker assembly. Set the enclosure aside.

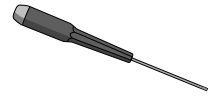
Tools Used



**14.** Pry off the speaker lid.



Tools Used



Fraction

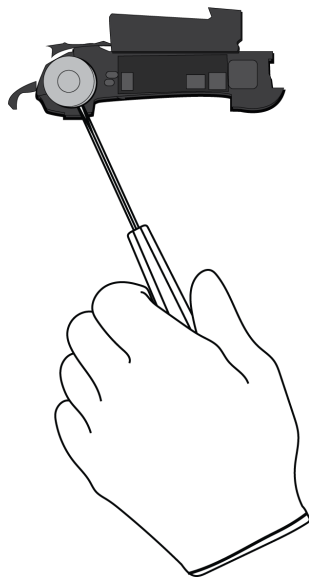


*Speaker lid*

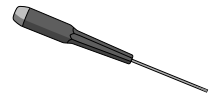
PL

Plastics

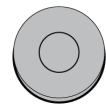
**15.** Pry off the speaker.



Tools Used



Fraction



*Speaker*

REE

Rare Earth  
Elements

Fraction

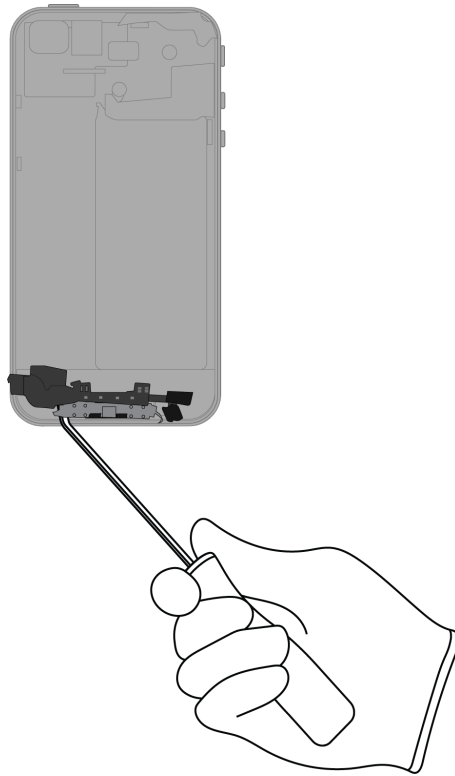


*Speaker assembly*

Cu

Copper

**16.** Pry the charging port off the enclosure.



Tools Used



Fraction

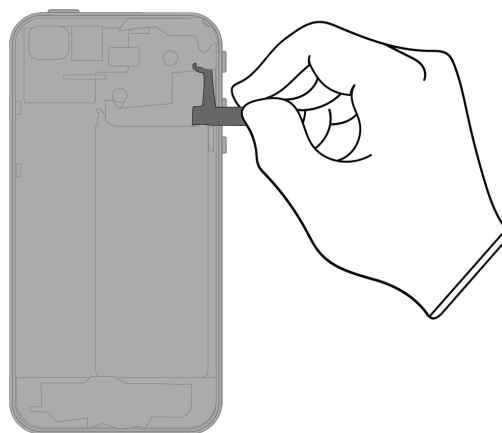


Charging port

Cu

Copper

**17.** Remove the ribbon cable.



Fraction



Ribbon cable

Cu

Copper

## 18. Separate the display from the enclosure.

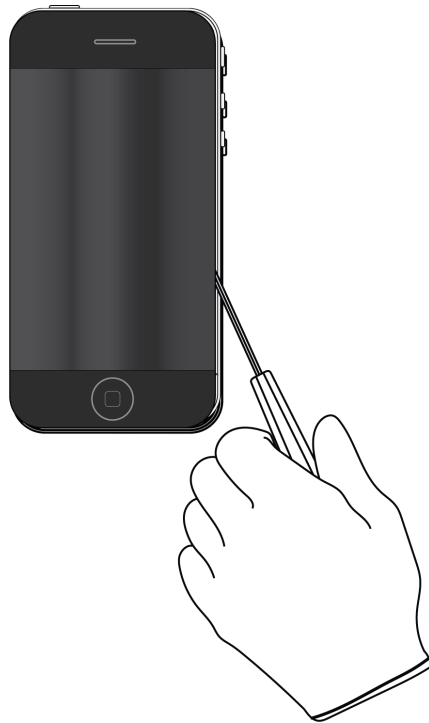


Broken glass hazard

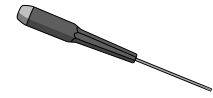


Chemical exposure hazard

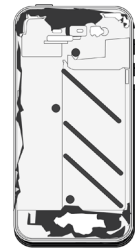
- » Lay the iPhone with the display face up.
- » Insert the tool tip between the display and the enclosure. Push the handle down to pry off the display.



### Tools Used



### Fraction

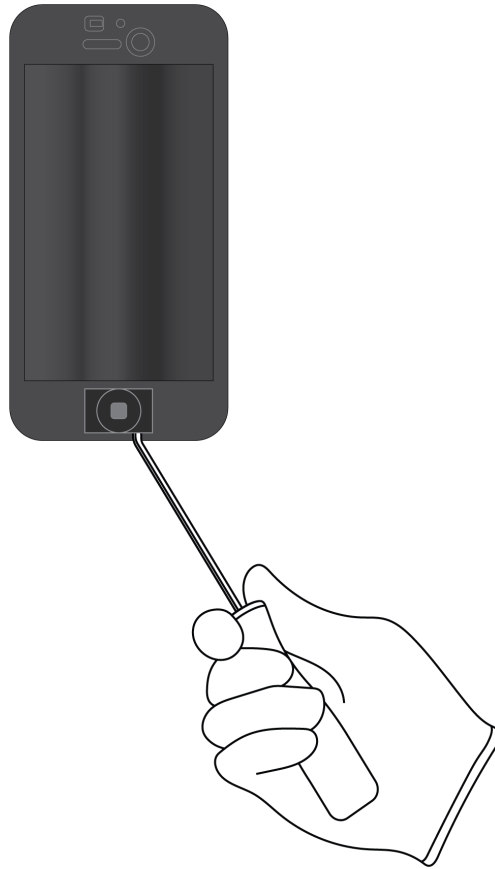


Enclosure

Al

Aluminum

## 19. Pry off the Home button.



### Tools Used



### Fraction



Home button

Cu

Copper

### Fraction



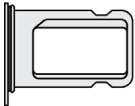








LCD cell

GL

Glass

# Material Categorization of Output Fractions

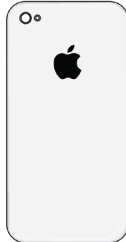
All outputs from this process must be managed, handled, and disposed of in accordance with applicable waste laws and regulations, including but not limited to the Waste Framework Directive and its national enactments in Europe.

Fraction	Downstream Processing
<p><b>Aluminum</b></p>  <p><i>SIM tray</i></p>  <p><i>Enclosure</i></p>	<p><b>Primary Target Material</b></p>  <p><b>Potential Additional Materials</b></p>  
<p><b>Batteries</b></p>  <p><i>Lithium-ion polymer battery</i></p>	<p><b>Primary Target Material</b></p> 
<p><b>Ferrous</b></p>  <p><i>Main logic board cover</i></p>	<p><b>Primary Target Material</b></p> 

**Fraction**

**Downstream Processing**

**Glass**



*Back panel*



*LCD cell*

**Primary Target Material**



**Potential Additional Materials**



**Logic Boards**



*Rear camera*



*SIM card*



*Main logic board*



*Front camera*

**Primary Target Material**



**Potential Additional Materials**





## Fraction

## Downstream Processing

### Mixed Electronics



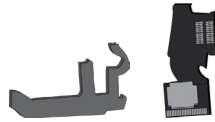
Power adapter



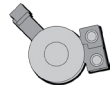
Charge cable



Headphone jack



Ribbon cables



Vibration motor



Speaker assembly



Charging port



Home button

### Primary Target Material



### Potential Additional Materials



**Fraction**

**Downstream Processing**

**Mixed Plastics**



*Speaker lid*

**Primary Target Material**



**Rare Earth Magnets**

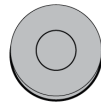


*Receiver*

**Primary Target Material**



**Potential Additional Materials**



*Speaker*

