

# Smartphones



1°A IIS "L.Nobili" RE Italy  
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# The components of smartphones:



Smartphones are made up of different parts, i.e. the display, the shell and the processors

# The display:

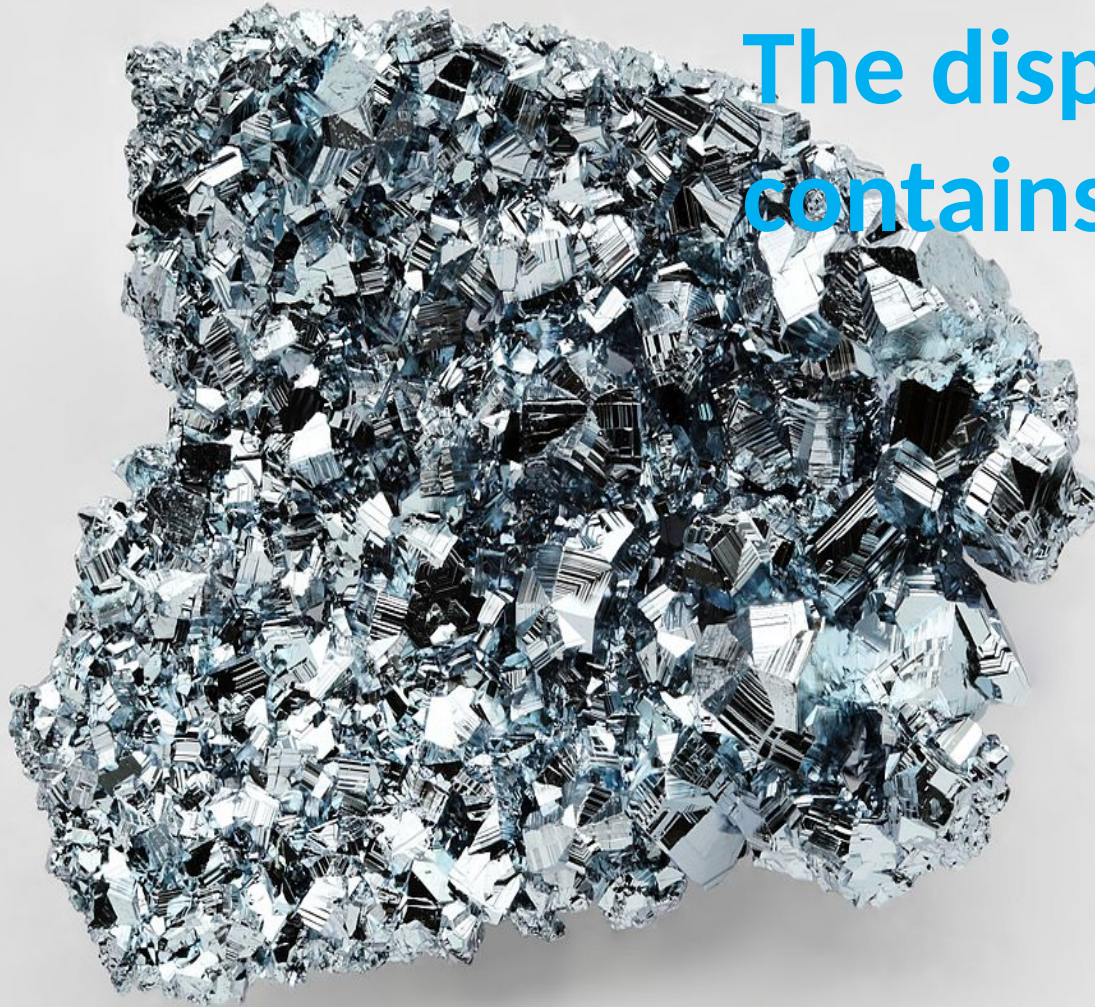


**The liquid crystal display offers both beautiful colours and the possibility to interact with the device**

# How is it made?

The surface has a polyethylene coat

# The display contains gallium



31	P <sup>o</sup> <sub>12</sub>
<b>Ga</b>	Ge
Gallium	
69.723	
[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p	[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p
5.9993	
49	

which is a semiconductor used in  
diodes to emit light

and rare earth elements,



that are a group of 17 elements with similar chemical properties.

The background of the slide is a dense field of optical fibers. The fibers are thin, dark lines that converge towards the bottom center, where they appear to glow with bright blue and cyan light. The light creates a bokeh effect, with many out-of-focus circular spots of varying sizes and colors, ranging from deep blue to bright cyan, scattered across the dark background.

**Rare earth elements are used in optical fibres  
as light conductors and as superconductors  
into the processor.**

**The display contains ITO,**

**a combination of indium and tin  
oxide used as conductor in the  
display.**



# The processor or CPU

It is the central unit of the device.  
It manages the execution of the  
operating system and the apps

# What materials is it made of?

The background of the slide is a detailed, glowing image of a computer processor chip. The chip is square with a grid of pins on its sides, and its surface is covered in a grid of small, glowing green and blue squares. The chip is set against a dark blue background with intricate circuit traces and glowing binary code (0s and 1s) scattered throughout. The overall lighting is a vibrant blue, giving the scene a futuristic and high-tech appearance.

The processor is made of  
different materials...

# And Tantalum

which is used in capacitors



Periodensystem

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
																2
																He
4											5	6	7	8	9	10
Be											B	C	73	N	O	Ne
12											13	14	15	16	17	18
Mg											Al	Si	P	S	Cl	Ar
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
88	89	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Uub	Uut	Uuq	Uup	Uuh	Uuo
103																
57	58	59	60	61	62	63	64	65	66	67	68	69	70	71		
La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tm	Yb	Lu						
89	90	91	92	93	94	95	96	97	98	99	100	101	102	103		
Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		

**Ta**  
Tantalum

including Silicon,

which is a semiconductor

# Gold, Copper and Silver

are used for the electronics micro components and the connections

# The battery



**It is a component which stores electricity to operate the device**

# It is composed of Lithium



The ions of  
lithium are  
fundamental for  
its operation

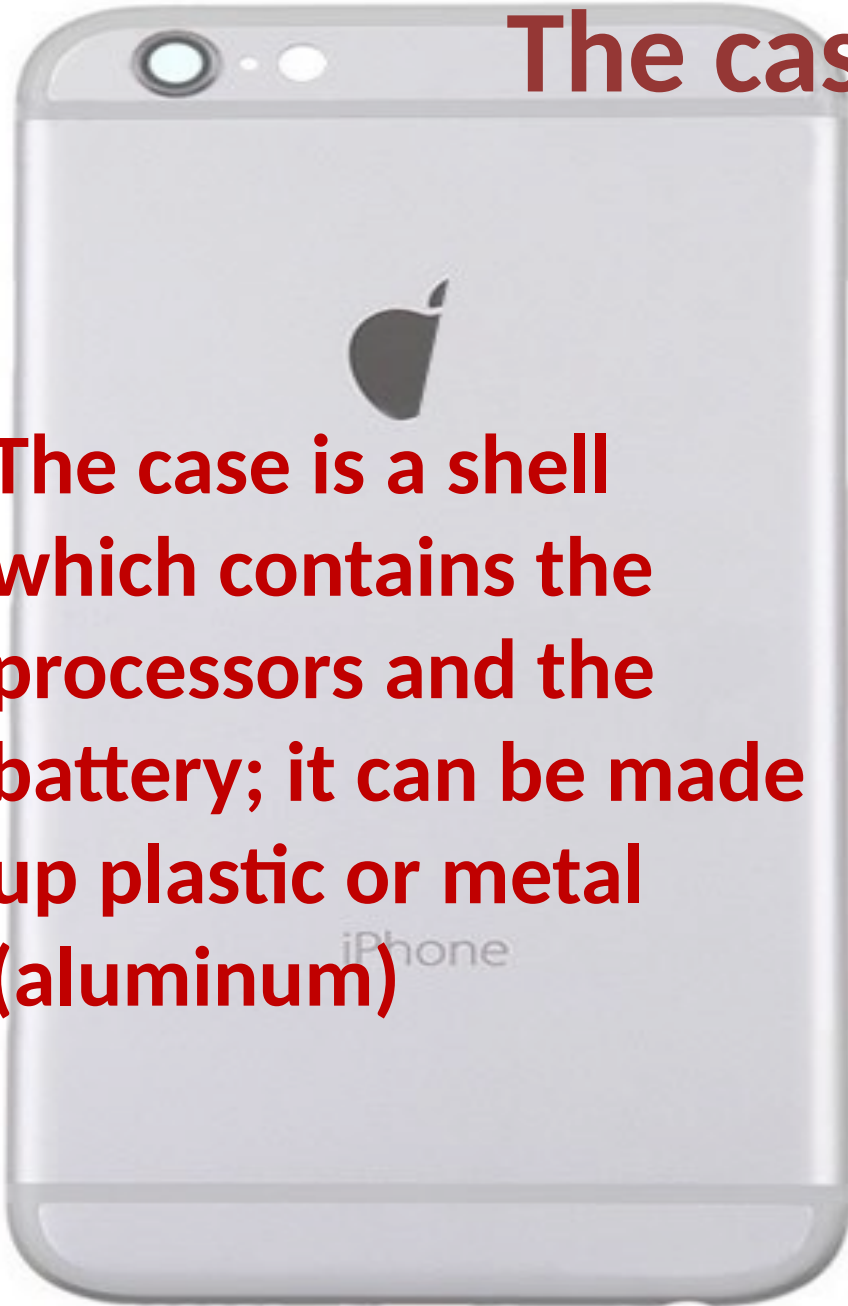
# And Aluminum

which forms the case of the battery



# The case

**The case is a shell which contains the processors and the battery; it can be made up plastic or metal (aluminum)**



# But can these components be recycled?



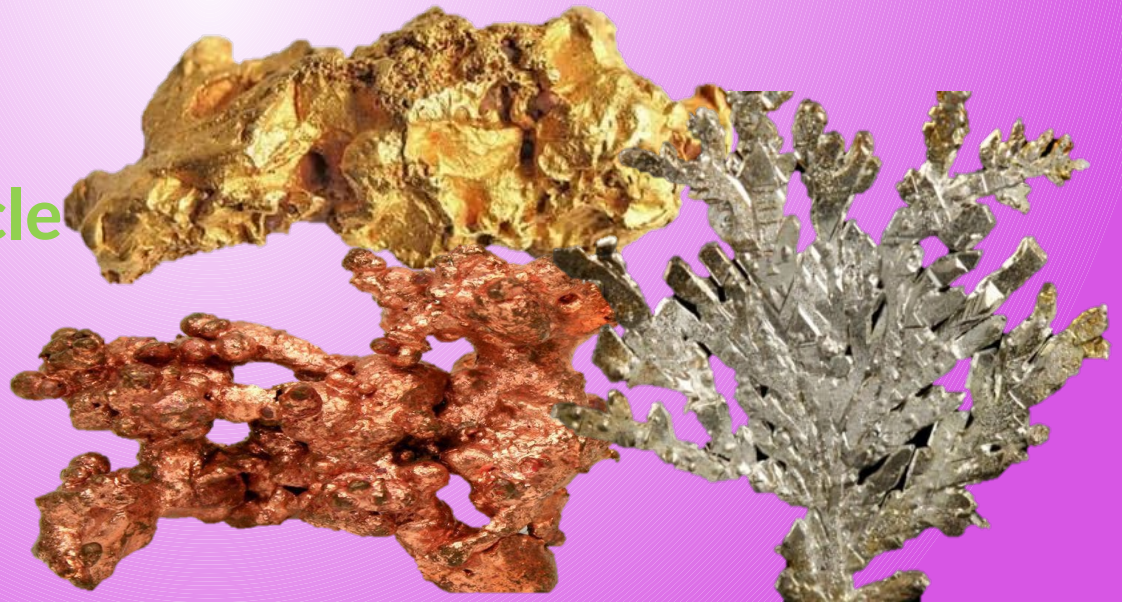
Silicon can be recycled to avoid spending more energy and money in production



Lithium and Aluminum can be recycled too



It is convenient to recycle gold, copper, and silver because they are very expensive materials



Among the elements which the display is made of, we can recycle ITO but with complicated and expensive treatments

An old phone can be used in different ways...

Moreover, an old phone can be used in different ways, for example:

It can be used as a spare phone...

Or as a present...

Or it can be given to charity



Otherwise, it must be taken to a landfill, where it will be disposed properly



# Mobile phones must be recycled!

To safeguard  
nature ...

Not to waste precious materials

**To save costs of production**





Remember that many components are extracted in poor countries, by exploiting the local population's workforce.

That falls back on poor people and children who risk their life for us every day...

... or rather they risk it for our objects!



# Thank you for your attention

## References:

[https://it.wikipedia.org/wiki/Touch\\_screen](https://it.wikipedia.org/wiki/Touch_screen)

<http://www.comefunziona.net/arg/touchscreenresistivo/4/>

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