

## How we use Metals, non-metals and metalloids

# Metals

Fe	Ni	Cr	Ag
Cu	Pb	Sb	Co
Mg	Hg	Pb	Ta

Plus lots more.....

### Metal Mixtures

- Stainless steel is made up of \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_  
The \_\_\_\_\_ and \_\_\_\_\_ prevent rusting  
\_\_\_\_\_ = a mixture of metals. We mix metals to give us better properties!  
(like not rusting)

### Designer metals

- Jewellery - pure gold is too soft to last so we mix \_\_\_\_\_ and \_\_\_\_\_ to harden it. So if you wear a gold ring, you are wearing a gold alloy!  
Pure gold is 24 carat gold. That means 24 of 24 parts are gold.  
Jewellery is often 18 carat gold. That means only 18 parts of 24 are gold. The other 6 parts are probably \_\_\_\_\_ or \_\_\_\_\_

### Art

- Glassblowers add metals to glass to create colour.  
\_\_\_\_\_ and \_\_\_\_\_ make glass yellow  
\_\_\_\_\_ makes glass blue.

### Everyday use

- Copper is used to wire our electrical circuits in the house. It is the best choice for this job since copper is \_\_\_\_\_ and \_\_\_\_\_  
and \_\_\_\_\_

### Special Uses

- \_\_\_\_\_ burns at such a high temperature (\_\_\_\_\_ °C) that it can burn underwater! (2000 Sydney Olympic torch was underwater)

### Hazards!!

- \_\_\_\_\_ - is often used to pierce ears but some people are \_\_\_\_\_ to nickel and develop a painful rash!

- \_\_\_\_\_ - once used in mining - has gotten into our environment. Mercury can damage the \_\_\_\_\_! (Remember the 'Mad Hatter' from *Alice in Wonderland*?)
- \_\_\_\_\_ - once used in plumbing pipes and paint. It can poison us. This metal was also used in paint and we think \_\_\_\_\_ may have had lead poisoning!

### **Save a Gorilla - Recycle your Cell Phone!**

- \_\_\_\_\_ is a rare metal that is strong and holds charges. It is perfect to use in the tiny circuits in a cell phone.
- This metal is mined in rainforests where Lowland Gorillas live and the mining activity has drastically reduced (down 70%) the gorilla population.
- Recycle your old phones! The Tantalum can be recycled!! This means less mining activity in the rainforest.

### **Q & A - Metals**

1. What property of these metals makes them useful for these applications?

a) Thin gold wires are used to connect one part of a computer chip to another.

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b) The bottom of some frypans are made of copper.

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2. Why is it important to take old car batteries containing lead to the hazardous waste depot?

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3. Why do people in older homes often let their water tap run for a few minutes before filling up their glass with water to drink?

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## Non-Metals

### *Non-Metals*

S, O, N, Ar, At, I, F, Cl,  
Br, He, Ar, Ne, Kr, Xe, Rn,  
C, P.

Although they represent a small percentage of the periodic table, non-metals make up over \_\_\_\_\_% of all the things around you! (Including you!) \*\*pie graphs\*\*

### **A solid Non-metal**

\_\_\_\_\_ is one of the few solid non-metals. We find it often at the edge of \_\_\_\_\_ Did you know that the links between sulphur atoms is what makes hair \_\_\_\_\_?

### **Non-Metals in Air**

Air is 78% = \_\_\_\_\_

21% = \_\_\_\_\_ (all animals need this to \_\_\_\_\_)

0.9 % = \_\_\_\_\_

0.1 % = \_\_\_\_\_

### **To React or Not to React**

Halogens - These are \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_

All highly reactive!

\_\_\_\_\_ is used to disinfect water (pools)

\_\_\_\_\_ is used in photography and medicines

\_\_\_\_\_ can disinfect wounds and kill bacteria in water (campers)

Noble Gases - These are \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_ and \_\_\_\_\_

\_\_\_\_\_ fill balloons - low density means they float in air!

\_\_\_\_\_ is in those cool blue lights on some cars

\_\_\_\_\_ and \_\_\_\_\_ are in decorative lights (colours!)

## Q & A - Non-metals

1. Why don't noble gases react? What is it about them?

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2. Hydrogen is even lighter (less dense) than Helium. It is also cheaper. Why isn't hydrogen used to fill balloons?

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3. Nitrogen becomes a liquid at  $-196^{\circ}\text{C}$ . A rubber ball placed in liquid nitrogen becomes very brittle. What do you think would happen if you tried to bounce the ball? **\*\*video\*\***

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## **Metalloids**

There are only \_\_\_\_\_ metalloids.

**Metalloids**

B, Si, Ge, As, Sb, Te, Po

That's it!

They are: \_\_\_\_\_ and \_\_\_\_\_ and

\_\_\_\_\_ and \_\_\_\_\_ and

\_\_\_\_\_ and \_\_\_\_\_ and

\_\_\_\_\_ and \_\_\_\_\_ and

## **Semiconductors (think computers!)**

\_\_\_\_\_ and \_\_\_\_\_ conduct electricity to some degree (not super well like copper but they do somewhat).

But the flow of electricity can be more easily controlled in semiconductors so they are useful in \_\_\_\_\_!

## **Toxic Element**

\_\_\_\_\_ has been used as a poison especially in old mystery novels. It was also used in industry and has contaminated our environment somewhat.