

# GN SPORTS EDITION things



*Resourcing tomorrow*  
**Australian  
Mining**

Produced by the  
Minerals Council of Australia

WIDE WORLD OF  
**MINERALS**



# WIDE WORLD OF **MINERALS**

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[minerals.org.au](http://minerals.org.au)



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**SPORTS EDITION**

**things**

## **SPORTS EDITION**

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# WIDE WORLD OF MINERALS

Welcome to the *Wide World of Minerals*, where we shine the stadium lights on the mined minerals and metals that help to make the great sporting moments possible.



From the Matildas to the Renegades to the Rabbitohs, Australia is a great sporting nation. Our national spirit, team pride and sense of fair play are derived from the sports we play, the sports we watch and the teams we love to support.

In the year of the XXXIII Olympiad, world class athleticism and record breaking performances are brought to the fore, and broadcast around the world. From the nickel and aluminium in the Olympic torch to the silicon and cesium in precision timekeeping, to the gold, copper and rare earth elements in fitness trackers, it all starts with minerals.

The Paris Olympics and Paralympics were the first in our lifetimes with the ambition to be 'climate positive'. Organisers committed to offset more carbon emissions than the Games emit. Critical to achieving this was solar, wind and nuclear energy, battery storage and electric transport. France is ahead of the game when it comes to clean energy – 70 per cent of its electricity is already produced with zero emissions from nuclear energy.

Battery minerals like lithium, nickel and cobalt were equally important to meet this ambition, as were the workhorses of energy generation and steel making – copper, coal and iron ore. From the Hunter Valley to the Pilbara, Australia's world-class mining industry played a critical role in helping to deliver the world its first climate positive Games.

SPORTS EDITION

# 30 things

Miners are also some of the biggest financial contributors to the sports we love. From Hancock Prospecting, the nation's largest private benefactor of Olympic and Paralympic teams to BHP, helping create a genuinely level playing field for women's football and the AFLW, these major sponsorships run parallel to the industry's broader investments in community sports across Australia.

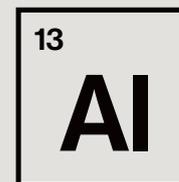
From mountain biking to horseback riding, junior netball to Little Athletics, miners invest millions of dollars every year in grassroots sports that foster inclusion and encourage education through participation, while at the same time unearthing the superstars of tomorrow. It's another reason why, year after year, mining finishes top of the podium as one of the nation's largest philanthropic industries.

So whether you're a spectator or an athlete, I hope the *Wide World of Minerals* ignites the sporting spirit in your household this year, next year and beyond.



**Tania Constable**  
Chief Executive Officer  
Minerals Council of Australia





Aluminium

# Aluminium

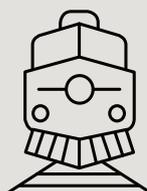
## COMMON USES



Aircraft



Canned food



Public transport



Housing



Cookware



Bicycles

## DID YOU KNOW?



### Wrapped in aluminium

Life Savers and Toblerone chocolate bars were among the first commercial uses of aluminium foil. Swiss chocolatier Tobler began wrapping bars in rolled foil in 1911. In the United States, aluminium replaced tin foil Life Saver wrappers in 1925.



## PROPERTIES

Symbol	Al
Atomic number	13
Atomic mass	26.98
Melting point	660°C
Electron configuration	[Ne] 3s <sup>2</sup> 3p <sup>1</sup>

Swimming pool



Carbon



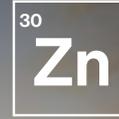
Iron



Manganese



Vanadium



Zinc



Copper



Silver



Zinc

Pool sanitation

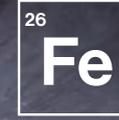
Diving platform



Aluminium



Chromium



Iron



Carbon

Starting blocks  
(ladders, handrails)

Robotic cleaners



Nickel



Copper



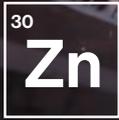
Nickel



Chromium



Tin



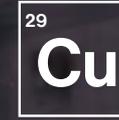
Zinc



Silicon



Gold



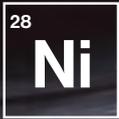
Copper

Touchpad sensors

Underwater cameras



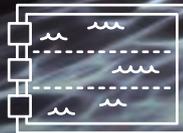
Aluminium



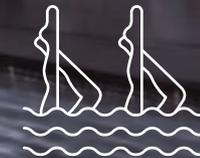
Nickel



Titanium



01



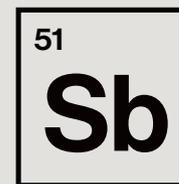
# SWIMMING

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Swimming became an Olympic sport in 1908, but women weren't allowed to compete until 1912. Australians Fanny Durack and Mina Wylie made history by winning gold and silver in the 100 metre freestyle.

National Library of Australia



Antimony

# Antimony

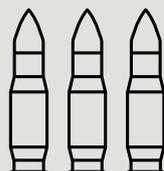
## COMMON USES



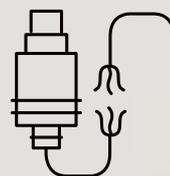
Batteries



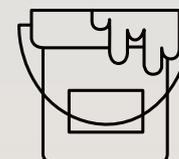
Fire retardant



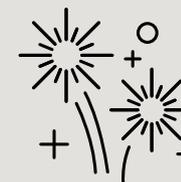
Ammunition



Cable sheathing



Paint



Fireworks

## DID YOU KNOW?



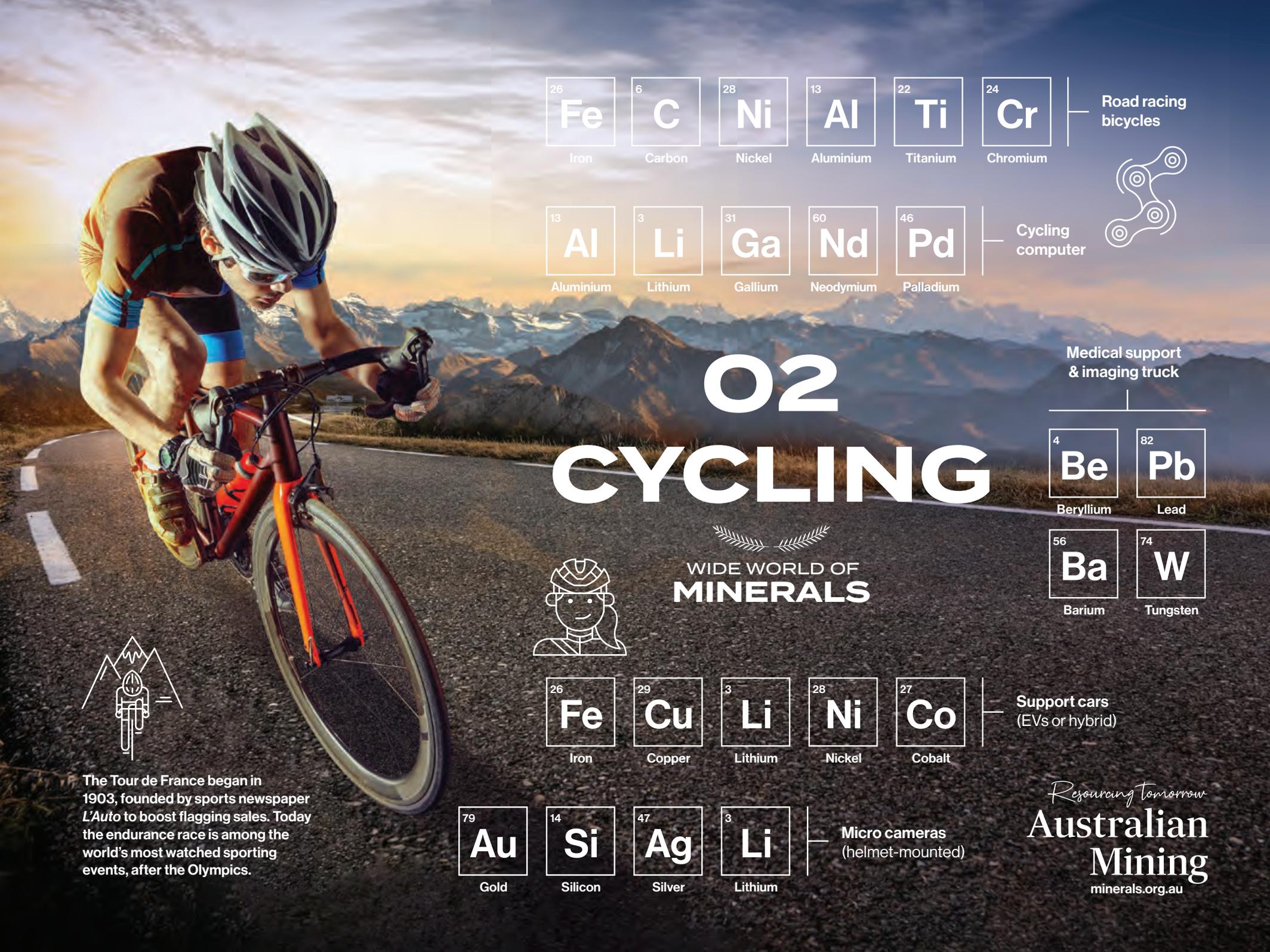
### The everlasting pill

Antimony was a popular remedy in the 19th century for the chronically constipated. Ingested as a small metal ball, it became known as the everlasting pill and would be collected and reused, sometimes passed down through generations.



## PROPERTIES

Symbol	Sb
Atomic number	51
Atomic mass	121.76
Melting point	630°C
Electron configuration	[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>3</sup>



Road racing bicycles



Cycling computer



# 02 CYCLING

Medical support & imaging truck



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Support cars  
(EVs or hybrid)

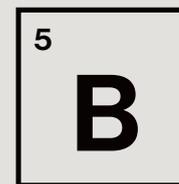


Micro cameras  
(helmet-mounted)



The Tour de France began in 1903, founded by sports newspaper *L'Auto* to boost flagging sales. Today the endurance race is among the world's most watched sporting events, after the Olympics.

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Boron

# Boron

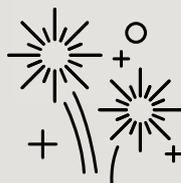
## COMMON USES



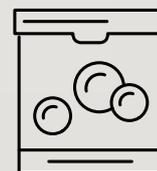
Tile glazes



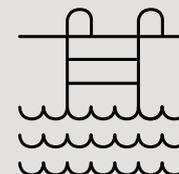
Rocket propellant



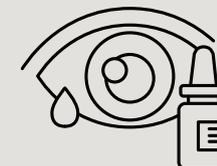
Fireworks



Washing powder



Pool cleaner



Eye drops

## DID YOU KNOW?



### The artisan's compound

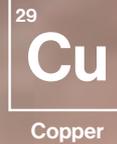
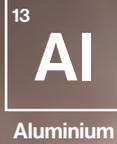
Boron compounds have been used for thousands of years. Borax, a composite of boron, sodium, oxygen and water, was mined from salt lakes in Tibet and Kashmir as early as 2000 B.C. It was used by gold and silversmiths and pottery makers.



## PROPERTIES

Symbol	B
Atomic number	5
Atomic mass	10.81
Melting point	2076°C
Electron configuration	[He] 2s <sup>2</sup> 2p <sup>1</sup>

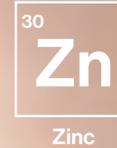
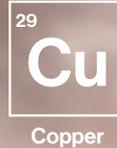
Starting pistol  
(electronic)



Track & field  
(inc. shot put,  
discus, javelin,  
hammerhead)



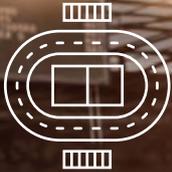
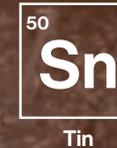
Lasers  
(inc. finish line,  
alignment and  
visual aids)



Starting  
block



VDM cameras  
(Video distance measurement)

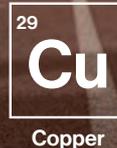


# 03

# ATHLETICS

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MINERALS

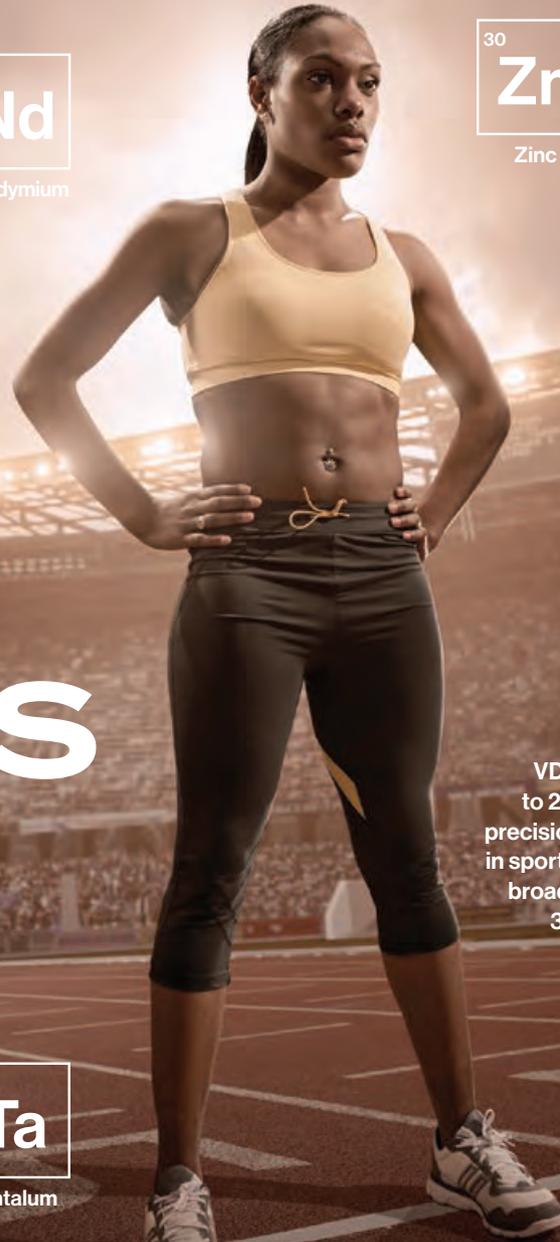
Biometric  
sportswear

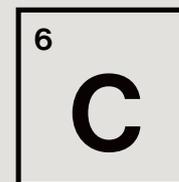


VDM cameras can capture up to 2000 frames per second for precision distance measurements in sports like long jump. Television broadcast cameras can capture 30 to 60 frames per second.



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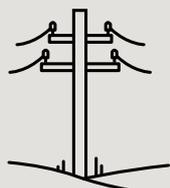




Carbon

# Carbon

## COMMON USES



Electricity



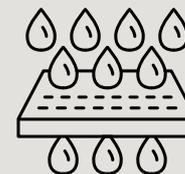
Cement



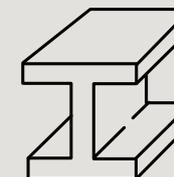
Carbon fibre



Wind turbines



Water filtration



Steel

## DID YOU KNOW?



### Giant swamp plants

The energy we get from coal today comes from giant swamp plants that lived before the dinosaurs. Sound far-fetched? All living plants store solar energy. Coal is the product of decaying plant matter that millions of years ago locked in this energy.



## PROPERTIES

Symbol	C
Atomic number	6
Atomic mass	12.01
Melting point	3,550°C
Electron configuration	[He] 2s <sup>2</sup> 2p <sup>2</sup>

Tennis racquet



Ball speed sensors

Electronic umpire (Hawk-Eye)



In a Grand Slam first, the Australian Open launched a real time, parallel tournament in the metaverse in 2022, and its own AO ArtBall NFT collection.

Tennis Australia



# 04 TENNIS

WIDE WORLD OF MINERALS



Stadium



Hard courts

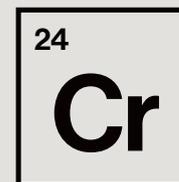


Perimeter displays (LED screens)



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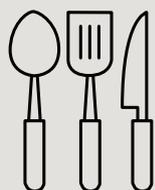




Chromium

# Chromium

## COMMON USES



Utensils



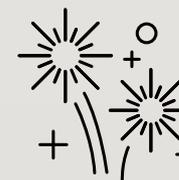
Leather tanning



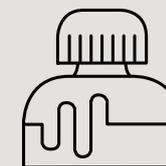
Chrome plating



Wood preservation



Fireworks



Dyes & inks

## DID YOU KNOW?



### Chromium-tipped swords

Chrome plating might be synonymous with the modern era, but it was also used as early as the Qin Dynasty in China. Archaeologists discovered swords tipped with chromium oxide during the unearthing of the Terracotta Army in the 1970s.



## PROPERTIES

Symbol	Cr
Atomic number	24
Atomic mass	51.9961
Melting point	1,890°C
Electron configuration	[Ar] 3d <sup>5</sup> 4s <sup>1</sup>

Snow goggles  
(glare control  
lenses)



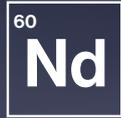
Iridium



Titanium



Aluminium



Neodymium



Snowboard &  
ski bindings



Iron



Aluminium



Titanium



Zinc

Ramps &  
jumps



Carbon



Manganese



Vanadium

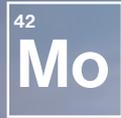
Chairlift



Iron



Aluminium



Molybdenum

Skis & ski poles  
(edges & fixtures)



Nickel



Chromium



Manganese



Aluminium



**EPIRB**  
(Emergency  
position indicating  
radio beacon)



Silicon



Lithium



Copper



Gold



Tin



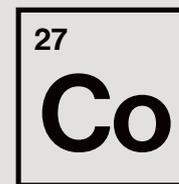
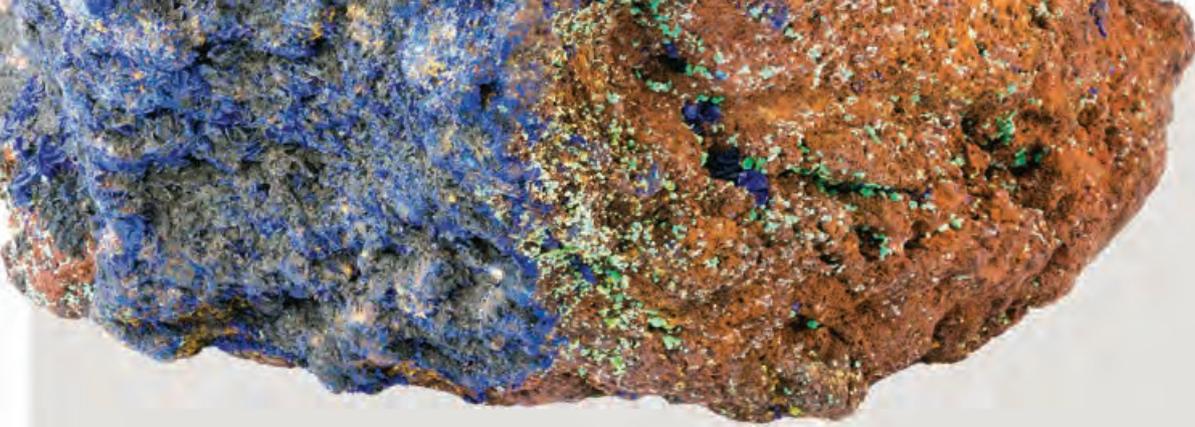
# 05 SNOW SPORTS

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The 'Snurfer' was the precursor to the modern snowboard, invented in 1965 by Michigan engineer Sherman Poppen who bolted two skis together to make a snow surfboard.

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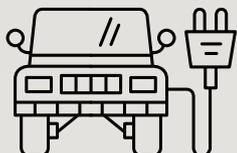
Cobalt

# Cobalt

## COMMON USES



Batteries



Electric cars



Ceramics



Wind turbines



Medical tracer



Jet engines

## DID YOU KNOW?



### From pigment to superalloy

Cobalt has provided the striking blue pigment used by potters and artisans to colour their wares for centuries. Today the indispensable metal is also used to make rechargeable batteries, such as those in EVs and smartphones, and as a critical superalloy in aerospace and defence industries.



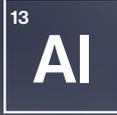
## PROPERTIES

Symbol	Co
Atomic number	27
Atomic mass	58.93
Melting point	1,495°C
Electron configuration	[Ar] 3d <sup>7</sup> 4s <sup>2</sup>

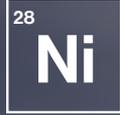
Formula 1 engines



Iron



Aluminium



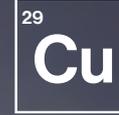
Nickel



Cobalt



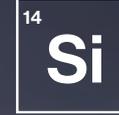
Titanium



Copper



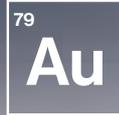
Silver



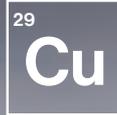
Silicon

Biometric gloves

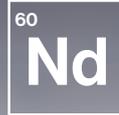
Cockpit comms (two-way radio)



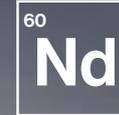
Gold



Copper



Neodymium



Neodymium



Lithium

06

# MOTOR SPORTS



WIDE WORLD OF MINERALS



Pit wall (mission control)



Carbon



Silicon



Titanium



Copper

Onboard cameras



Silicon



Cerium



Gold



Germanium



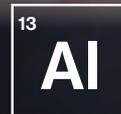
Yttrium



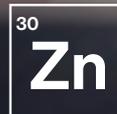
Titanium

Halo bar (driver protection)

Flame retardants



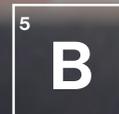
Aluminium



Zinc



Magnesium



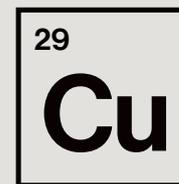
Boron



Sewerage covers on the Monaco Grand Prix street circuit are welded closed to prevent lifting caused by F1 racecar downforces.

[autosport.com](http://autosport.com)

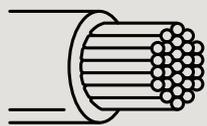
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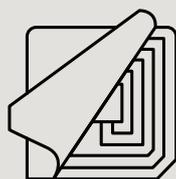
Copper

# Copper

## COMMON USES



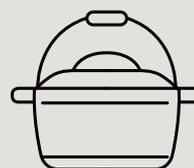
Electrical wiring



Circuit board



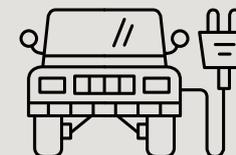
Plumbing



Homewares

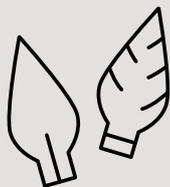


Instruments



Electric cars

## DID YOU KNOW?



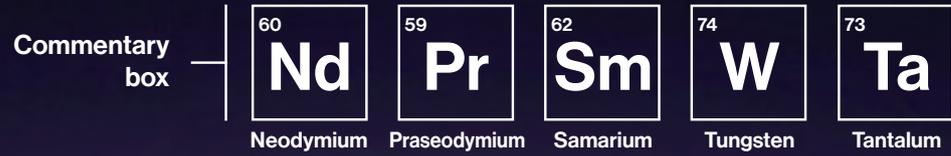
### Humankind's oldest metal

Copper is considered to be humankind's oldest metal. It is thought that Neolithic communities used copper as an alternative to stone tools during 8000 B.C. Ancient Egyptians believed copper was sacred and gave its wearer magical powers.

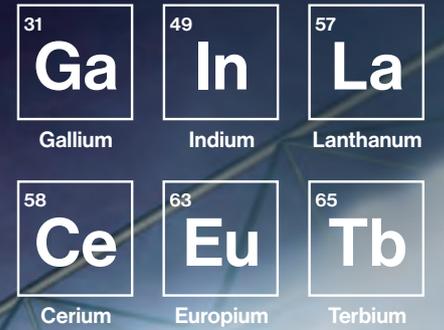


## PROPERTIES

Symbol	Cu
Atomic number	29
Atomic mass	63.55
Melting point	1,083°C
Electron configuration	[Ar] 3d <sup>10</sup> 4s <sup>1</sup>



Stadium tower lights (LED)



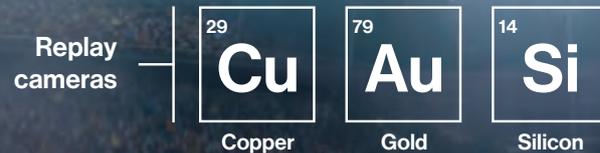
Often thought an Americanism, the name 'soccer' actually originated from aristocratic English boys in the 1880s who used the terms 'rugger' and 'soccer' to differentiate between rugby football and association football.

Britannica.com

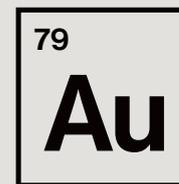


# 07 SOCCER

Resourcing tomorrow  
**Australian Mining**  
 minerals.org.au



WIDE WORLD OF  
**MINERALS**



Gold

# Gold

## COMMON USES



Awards



Investment



Electronics



Jewellery

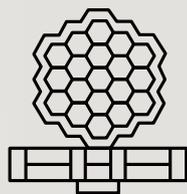


Advanced health



Aerospace

## DID YOU KNOW?



### James Webb Telescope

NASA's James Webb Space Telescope is equipped with 18 gold-coated hexagonal mirrors that reflect infrared light to observe the earliest formation of stars and search for exoplanets. It is so sensitive to infrared light it can detect the heat signature of a bumblebee at the distance of the moon.



## PROPERTIES

Symbol	Au
Atomic number	79
Atomic mass	196.97
Melting point	1,064°C
Electron configuration	[Xe] 4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>1</sup>

Golf clubs



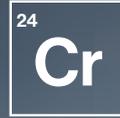
Iron



Titanium



Beryllium



Chromium



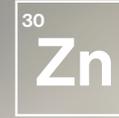
Iron



Manganese



Aluminium



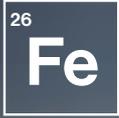
Zinc



Phosphorus

Course irrigation

Electric golf cart



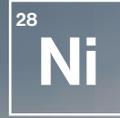
Iron



Aluminium



Lithium



Nickel



Cobalt



Gold



Lithium



Copper

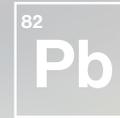


Tin



Tantalum

Digital scoring



Lead



Tungsten



Titanium

Club weight adjusters

Laser rangefinder



Silicon



Copper



Cerium



Neodymium



Dysprosium



Yttrium



Aluminium



Chromium

Golf ball retriever

Tournament trophies



Silver



Platinum



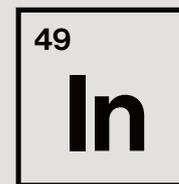
# 08 GOLF

WIDE WORLD OF MINERALS



Augusta National Golf Club is a stickler for its rules and customs, a long list which includes no running, no mobile phones, no cameras, no verbal outbursts, no coolers, no sitting on the grass...  
masters.com

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Indium

# Indium

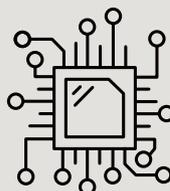
## COMMON USES



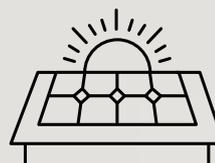
Touchscreens



Protective eyewear



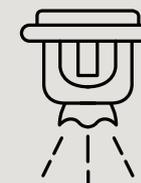
Microchips



Solar panels



LCD televisions



Fire sprinklers

## DID YOU KNOW?



### Cut with a knife

After a century of near obscurity, Indium is having its moment. Indium tin oxide is the material used for touch and flat screen tech and solar panels. Soft enough to cut with a knife, indium is also notable for the high pitched 'cry' it gives off when bent.

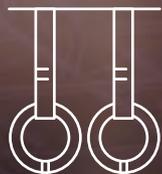


## PROPERTIES

Symbol	In
Atomic number	49
Atomic mass	114.82
Melting point	156.6°C
Electron configuration	[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>1</sup>

# 09

# GYMNASTICS



WIDE WORLD OF  
MINERALS



Gold



Copper



Silicon



Lithium



Gallium

Electronic  
scoreboard

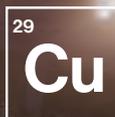


Alexander the Great and his Macedonian soldiers used an early pommel horse as far back as 315 BC to practice mounting and dismounting their battle horses quickly.

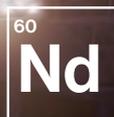
Performance  
music



Aluminium



Copper



Neodymium



Magnesium

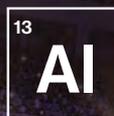
Apparatus  
(uneven bars,  
balance beam,  
vault etc)



Iron



Carbon



Aluminium



Iron



Carbon



Manganese

Sprung  
floor

Force  
plates



Aluminium



Gold



Silicon



Copper



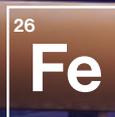
Magnesium



Zinc

Chalk

Trampoline  
springs



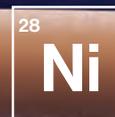
Iron



Manganese



Chromium



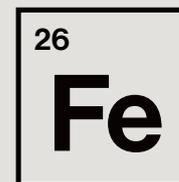
Nickel



Resourcing Tomorrow

# Australian Mining

minerals.org.au



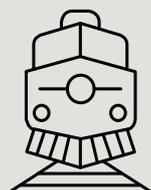
Iron

# Iron

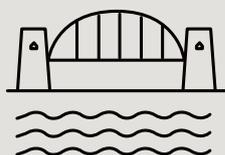
## COMMON USES



White goods



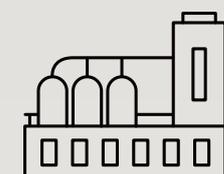
Public transport



Roads & bridges



Cities

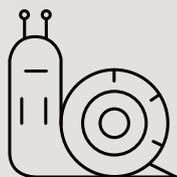


Manufacturing



Cars & trucks

## DID YOU KNOW?



### Armoured snails

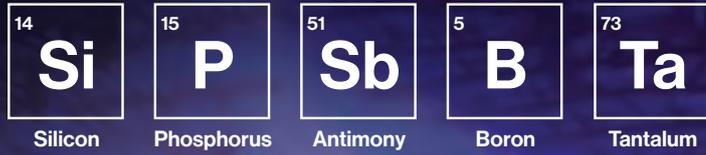
A deep-sea snail has evolved a suit of armour made from iron sulfide – the only animal on earth that uses iron in this way. The scaly-foot gastropod was discovered in 2001 and lives in the hydrothermal vent fields of the Indian Ocean.



## PROPERTIES

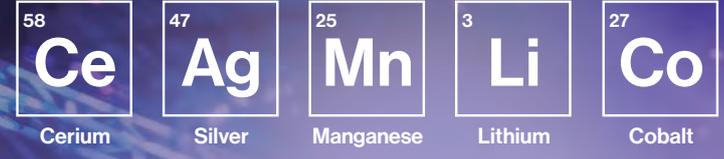
Symbol	Fe
Atomic number	26
Atomic mass	55.85
Melting point	1,538°C
Electron configuration	[Ar] 3d <sup>6</sup> 4s <sup>2</sup>

Computer processors

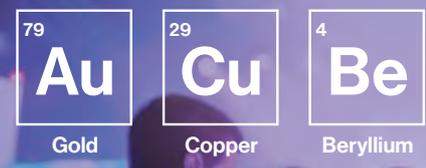


4K LCD monitors

Immersive headsets



Gaming consoles



5G network

Mechanical keyboard



Stanford University hosted the first e-sports event in 1972 – the prize a 1-year subscription to *Rolling Stone*. The market value today of e-sports is more than A\$200 billion. Fortune Business Insights



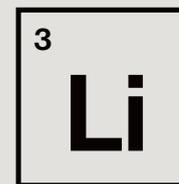
# 10 E-SPORTS

WIDE WORLD OF MINERALS



External hard drives

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minerals.org.au



Lithium

# Lithium

## COMMON USES



Armour plate



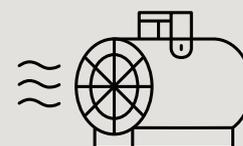
Lubricant



Batteries



Mental health



Industrial drying



Pacemaker

## DID YOU KNOW?



### Medicinal power of lithium

An Australian POW discovered the medicinal power of lithium in 1949. Dr John Cade survived three and a half years in Changi before returning to his work in Australia, where he successfully treated patients after noting the calming effects on guinea pigs.



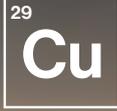
## PROPERTIES

Symbol	Li
Atomic number	3
Atomic mass	6.94
Melting point	180°C
Electron configuration	[He] 2s <sup>1</sup>

Ball-tracking sensors



Silicon



Copper



Gold



Lithium



Neodymium



Copper



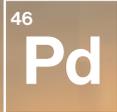
Silver



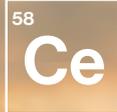
Indium

GPS tracker player vests

Pre-game entertainment



Palladium



Cerium



Potassium



Aluminium



Lithium



Tungsten



11

# FOOTBALL

WIDE WORLD OF MINERALS

Field graphics (pigment)



Titanium



Zinc



Gold



Live broadcasts

Sports stadium



Iron



Carbon



Tungsten



Nickel

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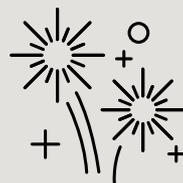
Magnesium

# Magnesium

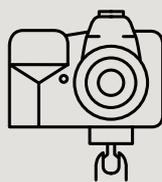
## COMMON USES



Aircraft



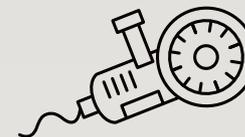
Fireworks



Cameras



Laxatives

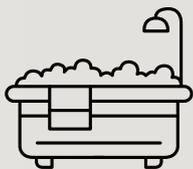


Power tools



Racecars

## DID YOU KNOW?



### Salve for weary bones

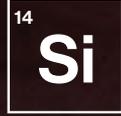
Epsom Salts originated from natural springs discovered in 1618 by cow-herd Henry Wicker in Epsom, England. The water's healing properties led physician and botanist Nehemiah Grew to extract the magnesium sulfate for medicinal purposes in 1695.



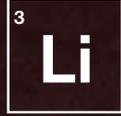
## PROPERTIES

Symbol	Mg
Atomic number	12
Atomic mass	24.31
Melting point	650°C
Electron configuration	[Ne] 3s <sup>2</sup>

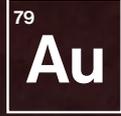
Timekeeping systems



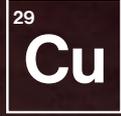
Silicon



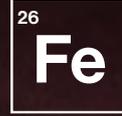
Lithium



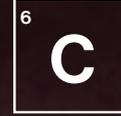
Gold



Copper



Iron



Carbon



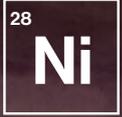
Molybdenum



Vanadium

Gymnastics (sprung floor)

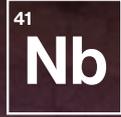
Olympic torch (Paris 2024)



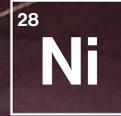
Nickel



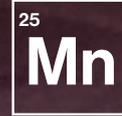
Aluminium



Niobium



Nickel



Manganese



Iron



Chromium



Molybdenum

Olympic cauldron



Uranium

Electricity generation in France (nuclear)



Paris 2024 Olympics medallists were awarded medals containing an original iron fragment from the Eiffel Tower, which opened in 1889. [paris2024.org](http://paris2024.org)

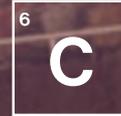
12

# OLYMPIC GAMES

WIDE WORLD OF MINERALS



Iron



Carbon

Track & field (inc. starting blocks, javelin, shot put, high jump etc)



Aluminium



Copper

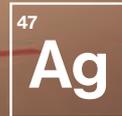


Zinc

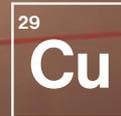
Olympic medals



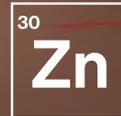
Gold



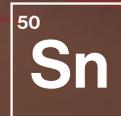
Silver



Copper



Zinc

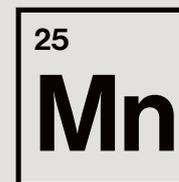


Tin

Bronze



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minerals.org.au



Manganese

# Manganese

## COMMON USES



Magnets



Deoxidiser



Fertiliser



Animal feed



Steel



Colourant

## DID YOU KNOW?



### Restoring balance

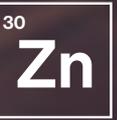
Manganese is important for good health and exists in some of the foods we eat. Too much environmental manganese can have a negative impact however, causing body tremors, aggression and delusions known as 'manganese madness'.



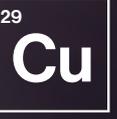
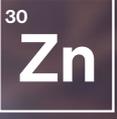
## PROPERTIES

Symbol	Mn
Atomic number	25
Atomic mass	54.94
Melting point	1,246°C
Electron configuration	[Ar] 3d <sup>5</sup> 4s <sup>2</sup>

Athlete's village



Wheelchair basketball (wheelchair)



Para archery (bow, arrows, sights)



Para powerlifting (cast iron discs/plates)



Paralympic history began in 1948 at a military hospital near London's Olympic Games when neurologist Sir Ludwig Guttmann organised a series of sporting events to speed up the recovery of WW2 paraplegic veterans.

Paris2024.org

Closing ceremony (fireworks)



13

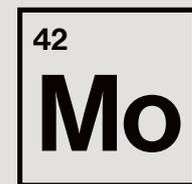


# PARALYMPIC GAMES

WIDE WORLD OF MINERALS

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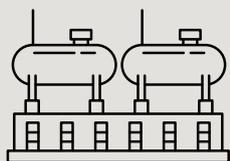




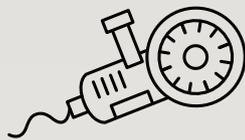
Molybdenum

# Molybdenum

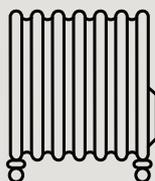
## COMMON USES



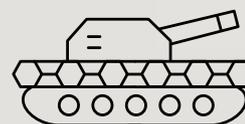
Petrol refining



Saw blades



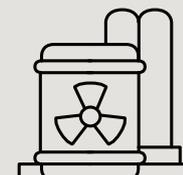
Heaters



Armour plating



High rises



Nuclear reactors

## DID YOU KNOW?



### Fighting crime

Molybdenum gives steel strength, but did you also know it is an important crime fighter? Some fingerprint powders contain molybdenum. Combined with other chemicals, the powder works by adhering to the oil and moisture of a latent print.



## PROPERTIES

Symbol	Mo
Atomic number	42
Atomic mass	95.95
Melting point	2,623°C
Electron configuration	[Kr] 4d <sup>5</sup> 5s <sup>1</sup>

# 14 MOUNTAIN BIKING

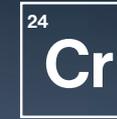
WIDE WORLD OF MINERALS



Iron



Carbon



Chromium

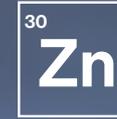


Molybdenum

Bike frame  
(chromoly steel)



Aluminium



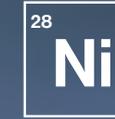
Zinc



Manganese



Iron



Nickel

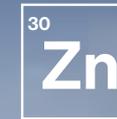
Repair kit  
(inc. spokes, valves, chains)



Aluminium



Copper



Zinc

Pressure gauge



Gold



Tantalum

GPS navigation unit



Tin



Tungsten



First aid kit  
(inc. scissors, antimicrobial pads, tweezers, bandage fasteners)



Iron



Copper



Silver

Electrolyte drinks



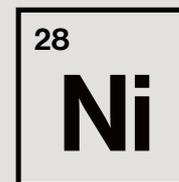
Potassium



Magnesium

The greatest vertical descent on a mountain bike in 24 hours is 40,840.5 metres, a 2018 world record jointly held by two Germans, Kabbani and Schweika.

Guinness World Records



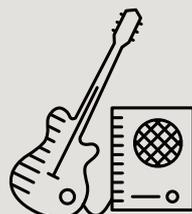
Nickel

# Nickel

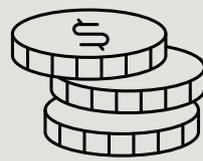
## COMMON USES



Food processing



Guitar strings



Coins



Marine engineering

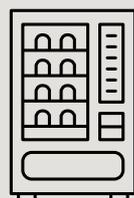


Electronics



Kitchen sink

## DID YOU KNOW?



### A nickel for a coke

A bottle of Coca-Cola could be bought for a nickel in the United States between 1885 until well into the 1950s. The company was committed to the fixed five cent price, largely because its vending machines only accepted nickels.



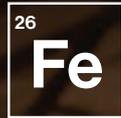
## PROPERTIES

Symbol	Ni
Atomic number	28
Atomic mass	58.69
Melting point	1,453°C
Electron configuration	[Ar] 3d <sup>8</sup> 4s <sup>2</sup>

# 15 WEIGHT LIFTING

WIDE WORLD OF MINERALS

**Weights**  
(Kettlebell, barbell, dumbbell & plates)



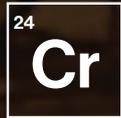
Iron



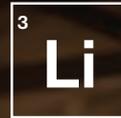
Carbon



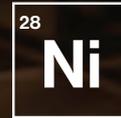
Silicon



Chromium



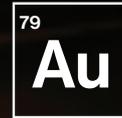
Lithium



Nickel



Cobalt



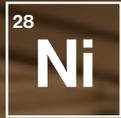
Gold

Message gun

**Rowers**  
(Ergometer)



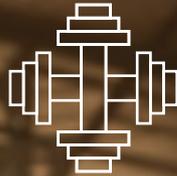
Iron



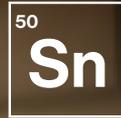
Nickel



Aluminium



Indium



Tin



Silver

Countdown clock



Boron



Yttrium



Icelandic actor and strongman Hafþór Júlíus (Thor) Björnsson, who played The Mountain in *Game of Thrones*, lifted 501 kg to achieve the world's heaviest deadlift in 2020.

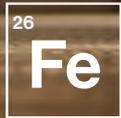
Guinness World Records



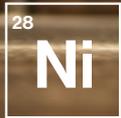
**Certified scales**



Aluminium



Iron



Nickel



Chromium



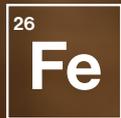
Iron



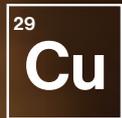
Carbon

Barbell jack

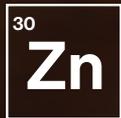
**Championship belt**



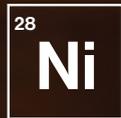
Iron



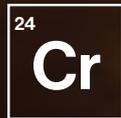
Copper



Zinc



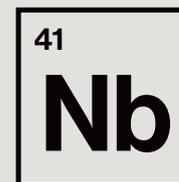
Nickel



Chromium



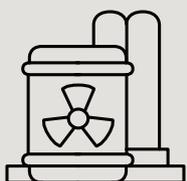
Resourcing tomorrow  
**Australian Mining**  
minerals.org.au



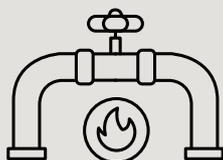
Niobium

# Niobium

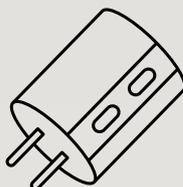
## COMMON USES



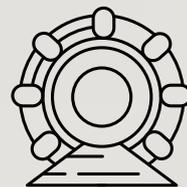
Nuclear energy



Gas pipelines



Capacitors



Particle accelerators



Spacecraft



MRI scanners

## DID YOU KNOW?



### From the Gods

Niobium got its name from Niobe, the Greek goddess of tears. Niobe was also the daughter of King Tantalus, who inspired the name for another element, tantalum. In nature, niobium and tantalum are almost always found side by side.



## PROPERTIES

Symbol	Nb
Atomic number	41
Atomic mass	92.91
Melting point	2,477°C
Electron configuration	[Kr] 4d <sup>4</sup> 5s <sup>1</sup>

Skateboard  
(trucks, bearings,  
hardware)



Iron



Carbon



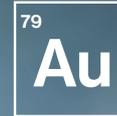
Nickel



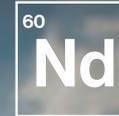
Chromium



Copper



Gold



Neodymium

Mounted  
camera

Half pipes,  
ramps & rails



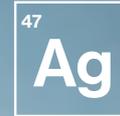
Iron



Manganese



Molybdenum



Silver



Lithium



Cobalt

Grip tape



Silicon



Carbon



Aluminium



Tony Hawk's Pro Skater video games introduced skateboarding and skate culture to a global audience in 1999 – and the sport is still growing in popularity. Its market value is expected to reach US\$4.16 billion by 2030.

[Researchandmarkets.com](http://Researchandmarkets.com)

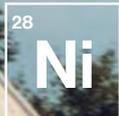
Inline skates  
(frames, axles,  
bearings)



Aluminium



Iron



Nickel



Titanium



Spare  
parts kit



Vanadium



Chromium



Tungsten



Molybdenum

Sunscreen



Titanium



Zinc

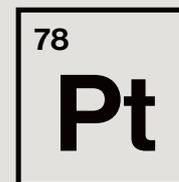


Magnesium

Resourcing tomorrow  
**Australian  
Mining**  
[minerals.org.au](http://minerals.org.au)

# 16 ROLLER SPORTS

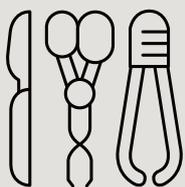
WIDE WORLD OF  
**MINERALS**



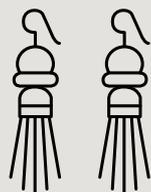
Platinum

# Platinum

## COMMON USES



Surgical tools



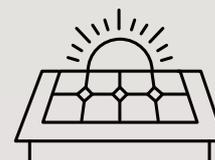
Jewellery



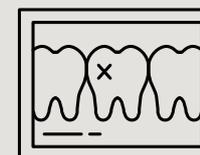
Catalytic converters



Polish

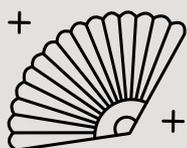


Solar panels



Dentistry

## DID YOU KNOW?



### By another name

Platinum is among the most prized metals in the world, both rarer and more expensive than gold. It does not oxidize and is a good electrical conductor. When the Spaniards first found the grey-white metal in Colombia in the 18th century they named it 'platina', which means 'little silver'.

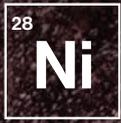
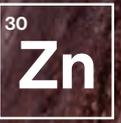


## PROPERTIES

Symbol	Pt
Atomic number	78
Atomic mass	195.08
Melting point	1,768°C
Electron configuration	[Xe]4f <sup>14</sup> 5d <sup>9</sup> 6s <sup>1</sup>

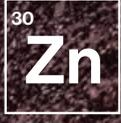


Belay  
(braking device)

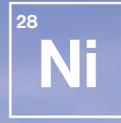


Climbing wall  
(indoor)

Harness &  
climbing chalk

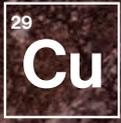


Water bottle  
(stainless steel)

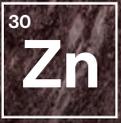


The first documented rock climb dates back to France, 1492. Antoine de Ville ascended a 1000-foot peak on the orders of King Charles VIII using ladders and grappling hooks – techniques developed for sieging castles.

EPIRB  
(Emergency position indicating radio beacon)



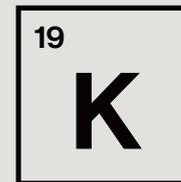
Sunscreen



# 17 ROCK CLIMBING

WIDE WORLD OF  
MINERALS

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**Australian  
Mining**  
minerals.org.au



Potassium

# Potassium

## COMMON USES



Fertiliser



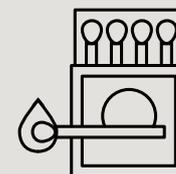
Detergents



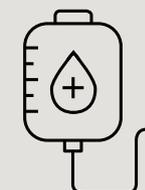
Salt substitute



Glass

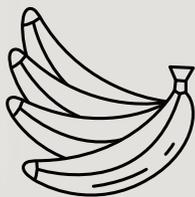


Match heads



Saline drip

## DID YOU KNOW?



### Loaded with potassium

Potassium is vital to good health and at the same time, radioactive. Loaded with potassium, bananas are among the most radioactive foods. Background radiation has been with us since the earth formed. Small amounts are not harmful to humans.



## PROPERTIES

Symbol	K
Atomic number	19
Atomic mass	39.10
Melting point	63.5°C
Electron configuration	[Ar] 4s <sup>1</sup>

Helmets



Carbon



Iron



Titanium



Silicon



Indium



Tellurium



Germanium

Hot Spot camera  
(infra-red tracking)

LED flashing  
red wickets



Gallium



Aluminium



Indium



Gold



Platinum



Barium



Silicon



Iron

Snickometer  
(sound detection)



The ICC Women's Cricket World Cup is the sport's oldest cricket championship. It was first played in 1973, two years before the first men's event.

International Cricket Council

18



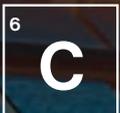
# CRICKET

WIDE WORLD OF  
MINERALS

Mechanical  
lawn roller



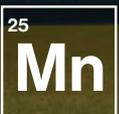
Iron



Carbon



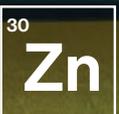
Silicon



Manganese



Nickel



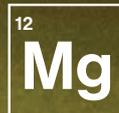
Zinc



Phosphorus



Potassium



Magnesium

Cricket ground  
fertilisers

Resourcing tomorrow  
**Australian  
Mining**  
minerals.org.au



Silicon



Silver



Lithium



Cobalt

Cricket bat  
sensors

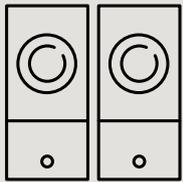


21, 39, 57-71  
**Ree**

Rare earth  
elements

# Rare earth elements

## COMMON USES



Speakers



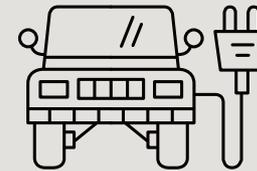
Wind turbines



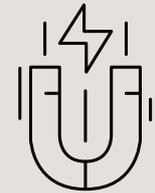
Telescopes



MRI scanners



Electric vehicles



Magnets

## DID YOU KNOW?



### Magnetic metals

Rare earth magnets make the strongest permanent magnets available, power the motors of electric vehicles and turn the blades of energy-generating wind turbines. They also make our favourite gadgets faster, smaller and lighter.



## THERE ARE 17 RARE EARTH ELEMENTS

- |            |              |           |
|------------|--------------|-----------|
| Cerium     | Lanthanum    | Scandium  |
| Dysprosium | Lutetium     | Terbium   |
| Erbium     | Neodymium    | Thulium   |
| Europium   | Praseodymium | Ytterbium |
| Gadolinium | Promethium   | Yttrium   |
| Holmium    | Samarium     |           |

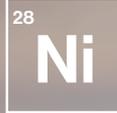
Water skis  
(& fittings)



Iron



Aluminium



Nickel



Carbon



Chromium



Silicon



Copper



Gold

Surf trackers  
(board-mounted  
performance sensors)

Hydrofoil  
board



Aluminium



Titanium



Carbon



Silicon



Copper



Neodymium



Dysprosium



Terbium

Competition  
megaphone

Jet ski



Iron



Chromium



Carbon



Zinc



Nickel



Gold



Silver



Copper

Tidal sensors  
(buoy-mounted)



Silicon



Lead

Surfboard artwork  
(inks & pigments)



Titanium



Cobalt

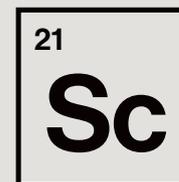


Apple Watch is killing off the megaphone at professional surfing comps. An app relays heat information, notifies surfers of violations and vibrates when it's time to catch a wave.  
World Surf League

# 19 WATER SPORTS

WIDE WORLD OF  
MINERALS

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Mining**  
minerals.org.au



Scandium

# Scandium

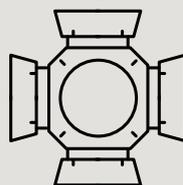
## COMMON USES



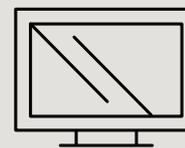
Bicycle frames



Aerospace



Studio lights



Televisions

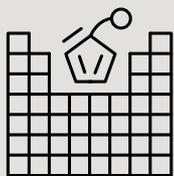


Fluorescent lamps



Defence industries

## DID YOU KNOW?



### Elemental predictions

Dmitri Mendeleev, the father of the periodic table, predicted the existence of an element with an atomic mass between 40 and 48 in 1869. Lars Fredrik Nilson detected such an element in 1879 which he named scandium, from the Latin Scandia meaning 'Scandinavia'.



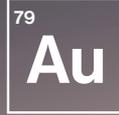
## PROPERTIES

Symbol	Sc
Atomic number	21
Atomic mass	44.96
Melting point	1,541°C
Electron configuration	[Ar] 3d <sup>1</sup> 4s <sup>2</sup>

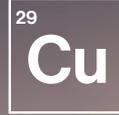
Photo finish cameras



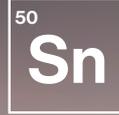
Silicon



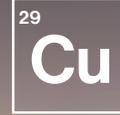
Gold



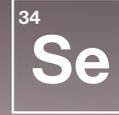
Copper



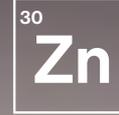
Tin



Copper



Selenium



Zinc



Cobalt



Sodium

Race horse nutrition



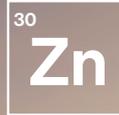
Starting gates



Iron



Carbon



Zinc



First run in 1861, the Melbourne Cup was a cup in name only until 1865. However, the first cup, deemed a monstrosity by its owner, was sold to the Flemington Hunt Club which rebranded the trophy for its own annual cup.

National Museum Australia

# 20

# HORSE

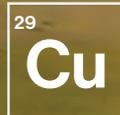
# RACING

WIDE WORLD OF  
**MINERALS**

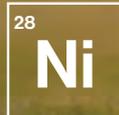
Horseshoes, stirrups & bits



Aluminium



Copper



Nickel

Thermal imaging  
(horse health)



Germanium



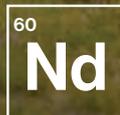
Indium

Melbourne Cup



Gold

Sound system



Neodymium



Tungsten



Molybdenum



Cadmium

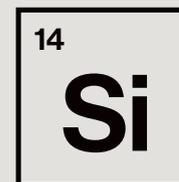


Platinum



Resourcing tomorrow  
**Australian Mining**  
minerals.org.au





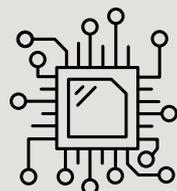
Silicon

# Silicon

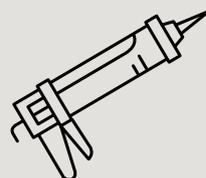
## COMMON USES



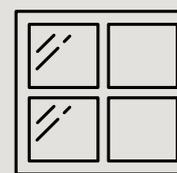
Pottery



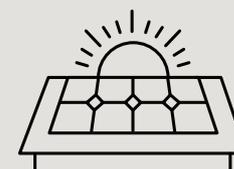
Semiconductors



Sealants



Glass



Solar panels



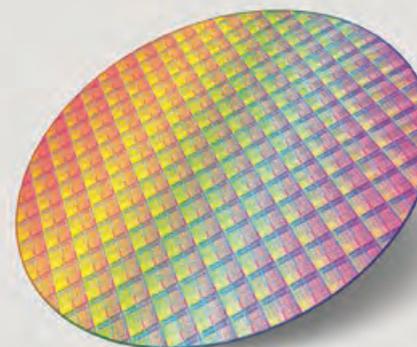
Cooking utensils

## DID YOU KNOW?



### The rise of Silicon Valley

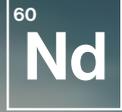
The name 'Silicon Valley' was popularised by tech reporter Don Hoefler in 1971 in a series of columns about the area's burgeoning semiconductor industry. The silicon chip remains a building block of modern day computers and electronics.



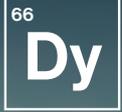
## PROPERTIES

Symbol	Si
Atomic number	14
Atomic mass	28.09
Melting point	1,414°C
Electron configuration	[Ne] 3s <sup>2</sup> 3p <sup>2</sup>

LED media mesh screen (Allegiant Stadium\*)



Neodymium



Dysprosium



Europium



Yttrium



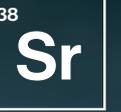
Aluminium



Barium



Antimony



Strontium

Half-time show (sound, lighting)

Translucent dome roof (stainless steel cable system at Allegiant Stadium\*)



Iron



Carbon



Chromium



Nickel



Manganese



Iron



Carbon



Titanium

Helmets & faceguards



# 21 GRIDIRON



WIDE WORLD OF MINERALS



For high school footballers in the US, the odds of being drafted to the NFL is roughly 0.00075%. That's around the same likelihood as being struck by lightning.

National Collegiate Athletic Association

Retractable turf field (motorised)



Iron



Manganese



Zinc



Phosphorus



Potassium

Climate-controlled stadium (Allegiant Stadium\*)



Copper



Platinum



Gold

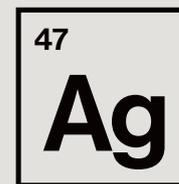


Palladium

\* Allegiant Stadium not pictured.



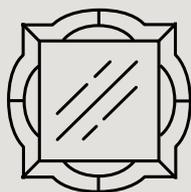
Resourcing tomorrow  
**Australian Mining**  
minerals.org.au



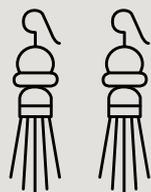
Silver

# Silver

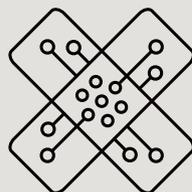
## COMMON USES



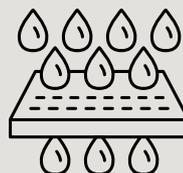
Mirrors



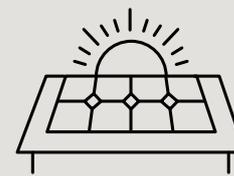
Jewellery



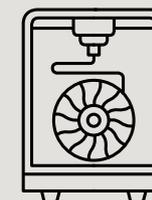
Wound care



Water purification



Solar panels



3D printing

## DID YOU KNOW?



### Beating bacteria

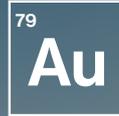
Silver has been used for centuries in medicine because of its antibacterial properties. It remains a wound management agent today, especially for burns patients. Unlike manufactured antibiotics, bacteria do not develop an immunity to silver.



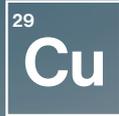
## PROPERTIES

Symbol	Ag
Atomic number	47
Atomic mass	107.87
Melting point	962°C
Electron configuration	[Kr] 4d <sup>10</sup> 5s <sup>1</sup>

Electronic scoring systems



Gold



Copper



Lithium



Silicon



Gallium



Aluminium



Phosphorus

Sights & optics

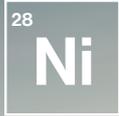
Archery bow riser



Aluminium



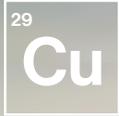
Magnesium



Nickel



Titanium



Copper



Competition pistols (& rifles, shotguns)



Iron



Carbon



Titanium



Zinc

Acoustic sensors



Zirconium



Titanium



Lead

Arrows



Aluminium



Carbon

Darts



Tungsten



Nickel



Iron



Copper

# 22

# PRECISION SPORTS

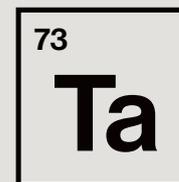


Five-time Olympic archer Khatuna Lorig trained actress Jennifer Lawrence how to convincingly handle a bow and arrow for *The Hunger Game* films.

WIDE WORLD OF  
**MINERALS**



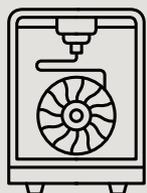
Resourcing tomorrow  
**Australian Mining**  
minerals.org.au



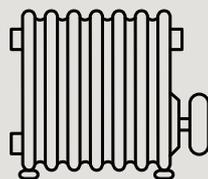
Tantalum

# Tantalum

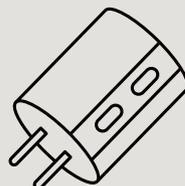
## COMMON USES



3D printing



Heat exchangers



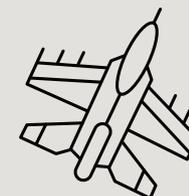
Capacitors



Surgical implants

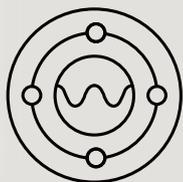


Jet engines



Defence industries

## DID YOU KNOW?



### Less abundant than gold

Tantalum is remarkable for being the rarest stable element in the solar system. Just one atom of tantalum exists for every 181 billion atoms of other elements, which makes tantalum far less abundant than any of the traditional precious metals, including gold.



## PROPERTIES

Symbol	Ta
Atomic number	73
Atomic mass	180.95
Melting point	3,017°C
Electron configuration	[Xe] 4f <sup>14</sup> 5d <sup>3</sup> 6s <sup>2</sup>

Motorcycle



Iron



Aluminium



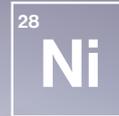
Carbon



Magnesium



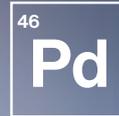
Titanium



Nickel



Silver



Palladium



Beryllium

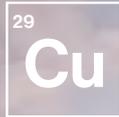
Transponder  
(RFID timing)



Radio receiver



Silicon



Copper



Gold



Gallium

Spectator barrier



Iron



Zinc

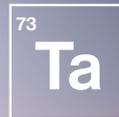


Aluminium

Helmet camera  
(point-of-view)



Silver



Tantalum



Motocross is not for the faint of heart. The risk of traumatic injury in motocross is 25 times higher than for football.

gitnux.org



Iron



Vanadium

Tool kit



Chromium



Tungsten



Molybdenum

# 23

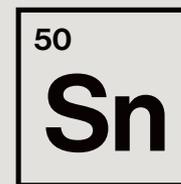
# MOTOCROSS



WIDE WORLD OF  
**MINERALS**



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**Australian Mining**  
minerals.org.au



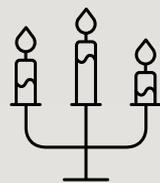
Tin

# Tin

## COMMON USES



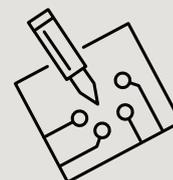
Magnets



Pewter



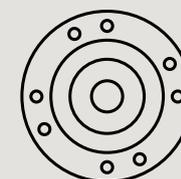
Tin cans



Solder



Touchscreens



Metal bearings

## DID YOU KNOW?



### Nod to the Academy

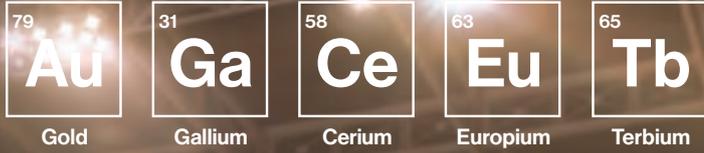
The Academy Award of Merit's Oscar statuette is made primarily of tin. The figure, a stylised knight holding a crusader's sword and standing on a film reel, is made of Britannia metal (93% tin, 5% antimony, 2% copper) and plated with 24 carat gold.



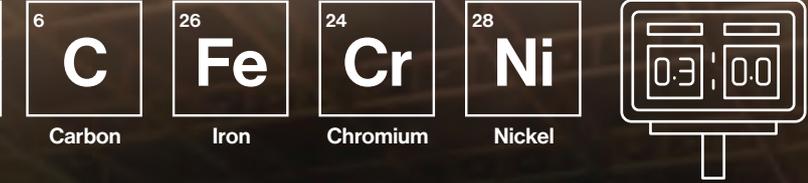
## PROPERTIES

Symbol	Sn
Atomic number	50
Atomic mass	118.71
Melting point	232°C
Electron configuration	[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>2</sup>

Electronic scoreboard



Basketball or netball hoops



# 24 BASKETBALL

WIDE WORLD OF MINERALS

The first basketball game ever played on Australian soil was in South Australia in 1897 – only six years after the sport was invented in the US.  
[Spalding.com.au](http://Spalding.com.au)

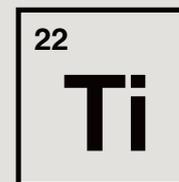
Countdown clock



Sound system



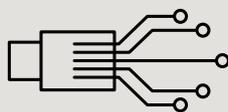
Resourcing tomorrow  
**Australian Mining**  
[minerals.org.au](http://minerals.org.au)



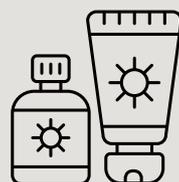
Titanium

# Titanium

## COMMON USES



Fibre optics



Sunscreen



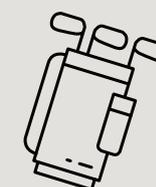
Aircraft engines



Medical implants



Car paint



Sporting goods

## DID YOU KNOW?



### To infinity and beyond!

Titanium mineral production comes from mineral sands. Named after the Greek Titans, titanium is twice as strong as steel but 45 per cent lighter. Resistant to corrosion, titanium is widely used in the aeronautics and aerospace industries.



## PROPERTIES

Symbol	Ti
Atomic number	22
Atomic mass	47.87
Melting point	1,670°C
Electron configuration	[Ar] 3d <sup>2</sup> 4s <sup>2</sup>

Figure skating blades



Aluminium



Nickel



Chromium



Titanium



Carbon



Iron



Zinc

Ice hockey goals

Force plate



Iron



Carbon



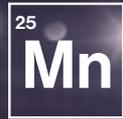
Aluminium



Silicon



Iron



Manganese



Vanadium



Chromium

Competition ice rink

25

# ICE SPORTS

WIDE WORLD OF MINERALS



Carbon



Molybdenum



Tungsten



Cobalt

Ice hockey blades



Iron



Chromium



Vanadium

Zamboni (ice resurfacer)



Tungsten



Molybdenum



Slow motion cameras



Copper



Gold



Tantalum



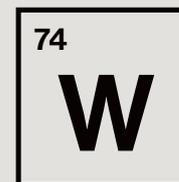
Tin



Ice skating is believed to have originated in Scandinavia as early as 1000 BC. People strapped animal bones to their feet to glide across frozen lakes rather than walk around them.

Britannica.com

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minerals.org.au



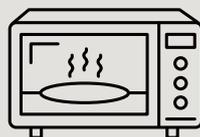
Tungsten

# Tungsten

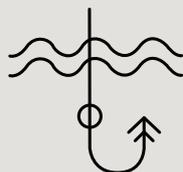
## COMMON USES



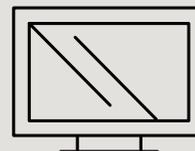
Light bulbs



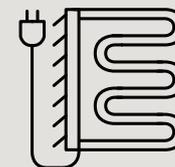
Microwaves



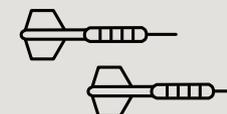
Fishing sinkers



Televisions



Heating elements



Darts

## DID YOU KNOW?



### In sheep's clothing

Tungsten is the metal of choice for gold counterfeiters. It has earned the dubious reputation because it shares a similar density to gold. Ingots filled with tungsten spooked markets and sparked conspiracy theories when discovered in 2012.



## PROPERTIES

Symbol	W
Atomic number	74
Atomic mass	183.84
Melting point	3,414°C
Electron configuration	[Xe] 4f <sup>14</sup> 5d <sup>4</sup> 6s <sup>2</sup>

Bobsleigh



Iron



Aluminium



Carbon



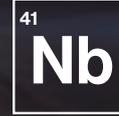
Titanium



Tungsten



Vanadium



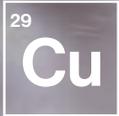
Niobium



Molybdenum

Steel runners

Ice track  
(refrigeration  
& evaporation)



Copper



Aluminium



Carbon



Zinc



Phosphorus



Boron



Vanadium

Reinforced  
concrete



Iron



Carbon

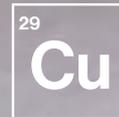


Manganese

Electronic  
sensors



Silicon



Copper



Gold



Silver



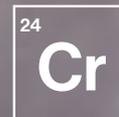
Lead



Aluminium



Manganese



Chromium

Bobsleigh shoes  
(spike plate)

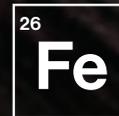


# 26

# BOBSLED

WIDE WORLD OF  
**MINERALS**

Brake lever



Iron



Carbon



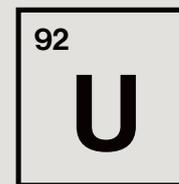
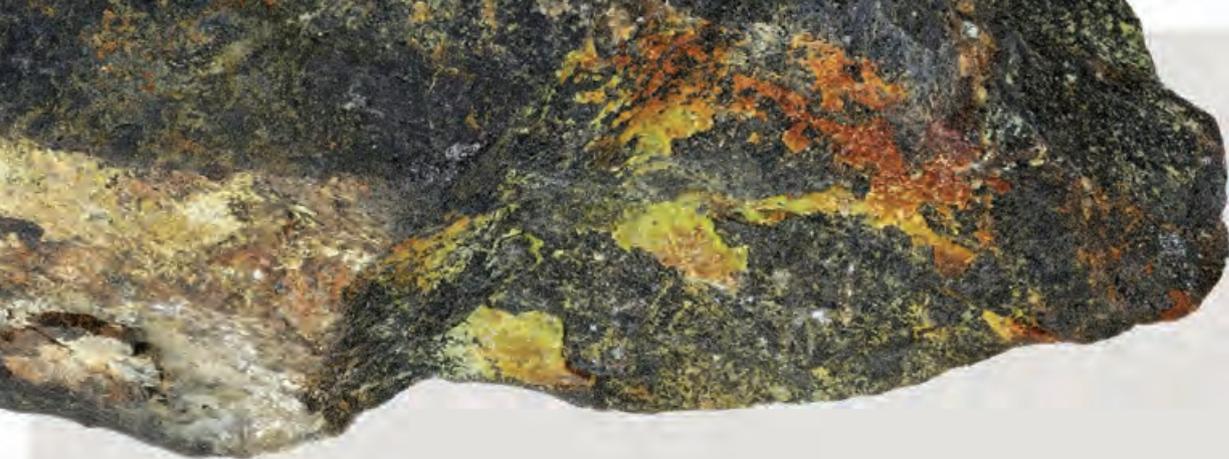
Aluminium



A 4-man sled can reach speeds of around 150 kph! Bobsledders can experience 5 or 6 Gs (g-forces) in some of the harshest corners.

International Bobsleigh & Skeleton Federation

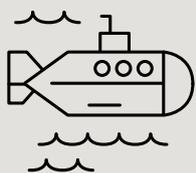
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minerals.org.au



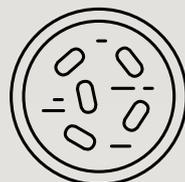
Uranium

# Uranium

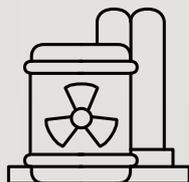
## COMMON USES



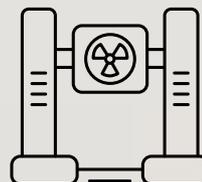
Submarines



Medical research



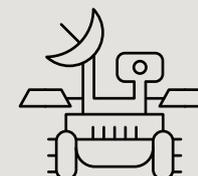
Nuclear energy



Industrial x-rays

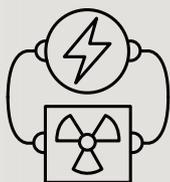


Cancer diagnosis



Aerospace

## DID YOU KNOW?



### The infinite power source

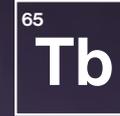
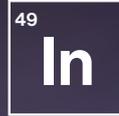
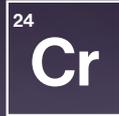
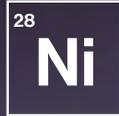
As a power source, uranium is practically infinite. Enriched uranium can produce 3.7 million times the energy of coal. It can also be reused multiple times. A golfball-sized amount of nuclear material provides a lifetime of energy for one person.



## PROPERTIES

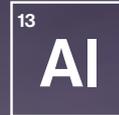
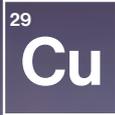
Symbol	U
Atomic number	92
Atomic mass	238.03
Melting point	1,135°C
Electron configuration	[Rn] 5f <sup>3</sup> 6d <sup>1</sup> 7s <sup>2</sup>

Face guard  
(batting helmet)

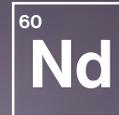
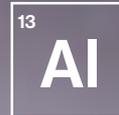


Night lights  
(LED stadium)

Motion sensors  
(pitchers & hitters)



High tech  
dugouts



National  
anthem  
(sound system)



World Series championship ring  
(white gold)



No longer just an American  
pastime, a Nespresso machine  
in the Italian team's dugouts stole  
the show at the World Baseball  
Classic clash in Taiwan.

NBC Sports



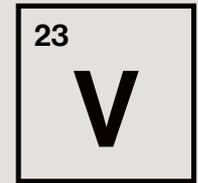
# 27

# BASEBALL



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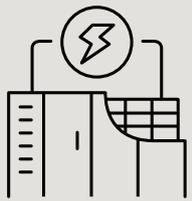
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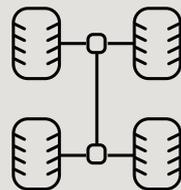
Vanadium

# Vanadium

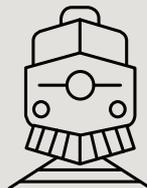
## COMMON USES



Battery storage



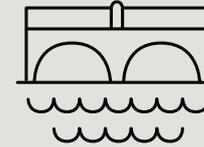
Car chassis



Railway tracks



Wind turbines



Bridges



Jet engines

## DID YOU KNOW?



### Driving early transportation

One of the first uses of vanadium was in the steel chassis of the 1908 Model T Ford. 'Tin Lizzie' represented the first affordable family car thanks to fabrication efficiencies and was declared Car of the Century at a glitzy ceremony in Las Vegas in 1999.



## PROPERTIES

Symbol	V
Atomic number	23
Atomic mass	50.94
Melting point	1,910°C
Electron configuration	[Ar] 3d <sup>3</sup> 4s <sup>2</sup>

Supermaxi yacht



Aluminium



Carbon



Iron



Chromium



Nickel



Copper



Tin



Tungsten



The inaugural Sydney to Hobart Yacht race in 1945 was originally intended as a post-World War II social cruise. British naval officer John Illingworth declared they make it a race.

Cruising Yacht Club of Australia

# 28

# YACHT RACING

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Iron



Tungsten

Hydraulic winches



Nickel



Chromium



Silicon



Indium



Gallium



Silver



Platinum

Navigation system



Lithium



Silicon



Copper



Gold



Aluminium

**EPIRB**

(Emergency position indicating radio beacon)



Gold



Copper



Neodymium



Ytterium



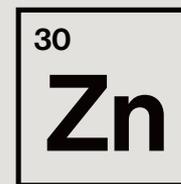
Samarium

Satellite phone



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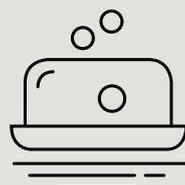
Zinc

# Zinc

## COMMON USES



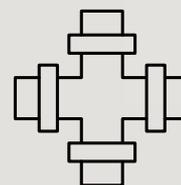
Rust prevention



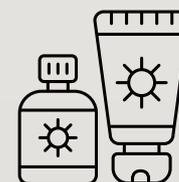
Soap



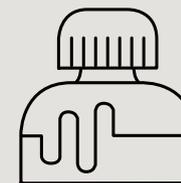
Plastics



Metal alloys



Sunscreen



Ink

## DID YOU KNOW?



### The original aphrodisiac

Oysters contain more zinc than any other food, which is one of the reasons they are believed to be an aphrodisiac. Zinc is crucial to hormone production. Casanova believed in the power of the mollusc – the 18th century lover would breakfast on 50 oysters.



## PROPERTIES

Symbol	Zn
Atomic number	30
Atomic mass	65.38
Melting point	420°C
Electron configuration	[Ar] 3d <sup>10</sup> 4s <sup>2</sup>

# 29 SKY DIVING

WIDE WORLD OF  
MINERALS

Propeller plane

26 <b>Fe</b> Iron	6 <b>C</b> Carbon	22 <b>Ti</b> Titanium	12 <b>Mg</b> Magnesium	4 <b>Be</b> Beryllium
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Altimeter  
(altitude reader)

13 <b>Al</b> Aluminium	29 <b>Cu</b> Copper	30 <b>Zn</b> Zinc	28 <b>Ni</b> Nickel	50 <b>Sn</b> Tin
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Wristcam  
(camera)

79 <b>Au</b> Gold	47 <b>Ag</b> Silver
73 <b>Ta</b> Tantalum	60 <b>Nd</b> Neodymium

Harness

26 <b>Fe</b> Iron	13 <b>Al</b> Aluminium	22 <b>Ti</b> Titanium
-------------------------	------------------------------	-----------------------------



Parachute  
AAD  
(automatic  
activation  
device)

14 <b>Si</b> Silicon	79 <b>Au</b> Gold	
29 <b>Cu</b> Copper	74 <b>W</b> Tungsten	28 <b>Ni</b> Nickel

Hook  
knife

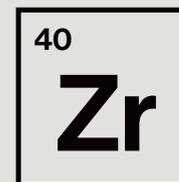
26 <b>Fe</b> Iron	6 <b>C</b> Carbon	24 <b>Cr</b> Chromium	42 <b>Mo</b> Molybdenum
-------------------------	-------------------------	-----------------------------	-------------------------------

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Wingsuiters are a different breed. The extreme sport has a death rate of 1 in 500 jumps. In 1912, French tailor Franz Reichelt tested his parachute/wing invention when he jumped to his death from the Eiffel Tower.

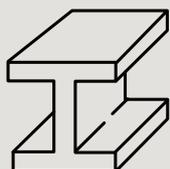
Gitnux.org



Zirconium

# Zirconium

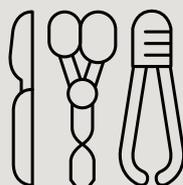
## COMMON USES



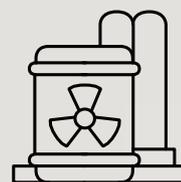
Steel alloys



Flash bulbs



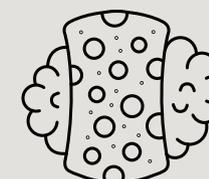
Surgical tools



Nuclear energy



Catalytic converters



Abrasives

## DID YOU KNOW?



### Cubic zirconias

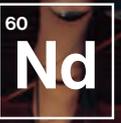
Soviet scientists discovered they could create cubic zirconias (zirconium combined with dioxide) in a laboratory in the 1970s. They faceted the stone, named the crystals 'Djevalite' and began marketing them as simulated diamonds in 1976.



## PROPERTIES

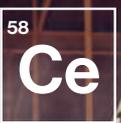
Symbol	Zr
Atomic number	40
Atomic mass	91.22
Melting point	1,854°C
Electron configuration	[Kr] 4d <sup>2</sup> 5s <sup>2</sup>

Punch trackers



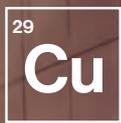
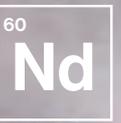
Combat ring (boxing, cage, octagon etc)

Weighted vests

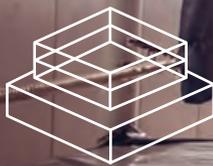


VR simulators (training)

Ring announcer



Biomechanic tools (motion capture)

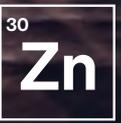
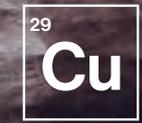


Boxing first appeared as a formal Olympic event in the 23rd Olympiad (688 BC). However, visual evidence for boxing appears from the 3rd millennium BC in ancient Sumerian relief carvings.

Britannica.com

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Trip gong (boxing bell)



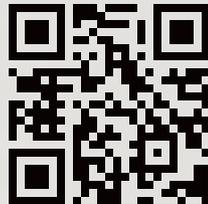
# 30 COMBAT SPORTS

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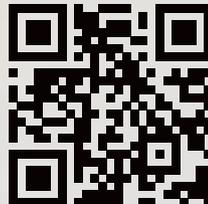
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**can things**



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**Minerals Council of Australia**

Ph. +61 2 6233 0600

E. [info@minerals.org.au](mailto:info@minerals.org.au)

[minerals.org.au](http://minerals.org.au)

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July 2024





SPORTS EDITION

30  
things

