



W

things

Produced by the Women's Mining Coalition



Find us on



Women's Mining Coalition

Email Emily.arthun@wmc-usa.org

www.wmc-usa.org

The WMC thanks the Minerals Council of Australia for their generosity in permitting our use of their copyrighted materials in the presentation.

Everyday things mining makes possible



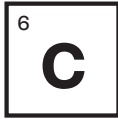
01 Electricity	16 Batteries
02 Food processing	17 Commercial printing
03 Health care	18 Dentistry
04 Smartphones	19 Funerals
05 Appliances	20 Film & television
06 Electric cars	21 Meat & veggies
07 Defense	22 Home protection
08 Solar panels	23 Environmental solutions
09 Your house	24 Sports championships
10 Public transport	25 Birthing suites
11 Cleaning products	26 Brewing beer
12 The Golden Gate Bridge	27 Lenses & telescopes
13 iPads & Xboxes	28 Roads & rail
14 Personal hygiene	29 Wind farms
15 Currency	30 Space travel

Note: Interspersed information provided on periodic table elements is provided in order of Z to A.

**Everything comes
from somewhere.**

**If it didn't grow,
it was mined.**

Energy generation



Carbon
(Coal)



Uranium

Production and transmission



Iron



Copper

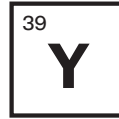


Aluminum

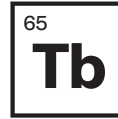
Fluorescent lighting



Lanthanum



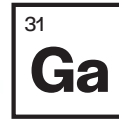
Yttrium



Terbium

Mining makes powering the world possible

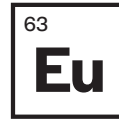
LED



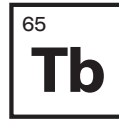
Gallium



Cerium

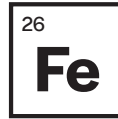


Europium

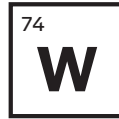


Terbium

Halogen



Iron



Tungsten



Chromium

01 Electricity

The amount of energy Google requires to conduct 100 searches is as much as a standard light bulb burning for 28 minutes.*

<https://www.electrichoice.com/blog/50-surprising-facts-on-energy-consumption/>

U.S. is a net Energy Producer

For the first time since 1957, in 2019, the annual U.S. energy production exceeded energy consumption -- producing 01.0 quads of energy while only consuming 100.2 quads.*

<https://www.eia.gov/energyexplained/us-energy-facts/>

We can find zirconium in the essential ceramics, knives, and interior design items in our lives. We can also find zirconium in the surrounding buildings, even the military, and nuclear power fields.

<https://www.refractorymetals.org/facts-about-zirconium/>

Australia and South Africa have the largest share of zirconium reserves globally. Florida produces zirconium from coastal aggregate deposits.

Zirconium is used as an ingredient to increase the strength of magnesium alloys. Zirconia ceramics provide an ultra-thin, diamond-like coating for jet engine blades, protecting the metal alloy of the blades and allowing them to withstand significantly higher temperatures.

Zirconium



Steel alloys



Flashbulbs



Surgical instruments



Deodorant

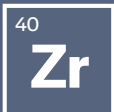


Catalytic converters



Abrasives

Headquartered in Lake Forest, California, Advanced Refractory Metals is a leading manufacturer and supplier of refractory metals such as tungsten, molybdenum, tantalum, rhenium, titanium, and zirconium across the world - providing customers with high-quality refractory metal products.



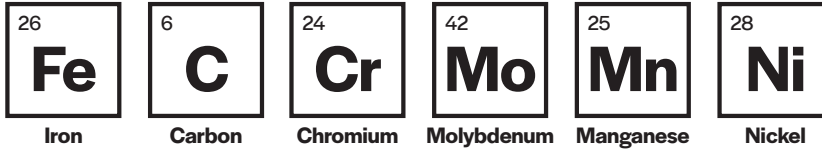
Zirconium

Did you know?

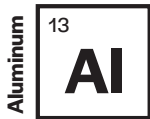
Soviet scientists discovered they could create cubic zirconias (zirconium combined with dioxide) in a laboratory in the 1970s. They faceted the stone, named the crystals 'Djevalite' and began marketing them as simulated diamonds in 1976.



Machinery used to process and manufacture food

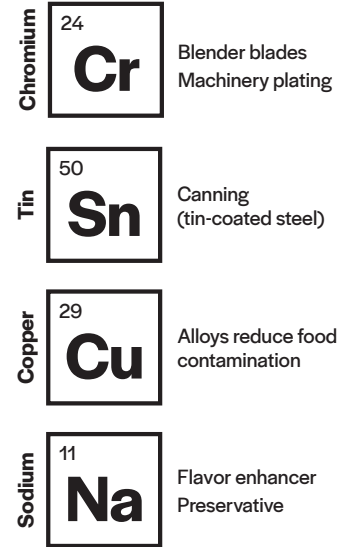


Coca-Cola uses 300,000 tons of aluminum every year in the U.S. - 17.4% of total U.S. aluminum production



Foil packets
Drink cans

Mining makes the preservation of food possible



02 Food processing

Sustainable coffee pods

Rio Tinto has partnered with coffee giant Nespresso to supply sustainable aluminum for its coffee capsules after becoming the world's first company to be certified by the Aluminum Stewardship Initiative (ASI). Certification reflects the highest environmental, social and governance practices across the aluminum lifecycle.

Zinc



Rust prevention



Soap



Plastics



Metal alloys



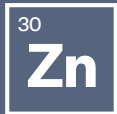
Sunscreen



Rubber



Ink



Zinc

Did you know?

Oysters contain more zinc than any food - one reason they are believed to be an aphrodisiac. Zinc is crucial to hormone production. Casanova believed in the power of the mollusk - the 18th-century lover would breakfast on 50 oysters.



Titanium ²²
Ti
Artificial joints
Prosthetic limbs
Surgical equipment

Copper ²⁹
Cu
Kills surface microbes
and reduces infections
Electronic devices

Silver ⁴⁷
Ag
Anti-bacterial
Aids healing

Platinum ⁷⁸
Pt
Pacemakers
Medical apparatus

Lithium ³
Li
Treatment of
bipolar disorder
Medical implant
batteries

Mining makes modern medicine and treatment possible

Metal-based compounds are crucial to the diagnosis and treatment of disease.

Uranium ⁹²
U
Cancer treatments
Radiation therapy

Niobium ⁴¹
Nb
Medical devices

03

Health care

Gadolinium ⁶⁴
Gd
MRIs and x-rays
Diagnostic tracer

Gold ⁷⁹
Au
Diagnosis
Nanotechnology

Gold nanoparticle technology
The nanotechnology boom has opened up a new frontier of early detection, diagnosis and treatment of diseases. Gold nanoparticle technology is being used to target and deliver antibodies directly into cancerous tumors as well as being engineered to attach to cancer-related proteins to aid earlier detection.

Uranium



Submarines



Medical research



Clean energy



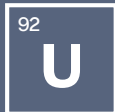
Industrial x-rays



Cancer treatments



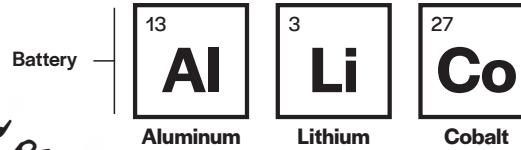
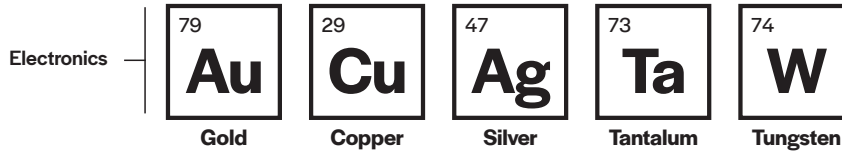
Aerospace



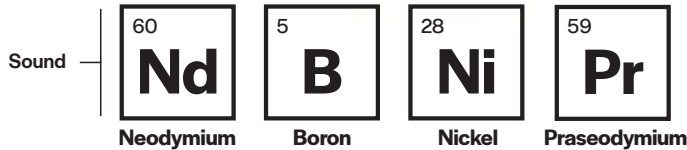
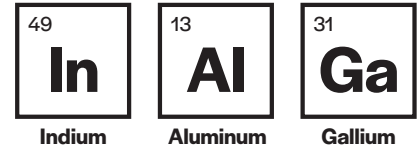
Uranium

Did you know?

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.



Touch screen



04 Smartphones

Mining makes holding the world in your hand possible

More than 40 mined metals and rare earths are used to produce a single smartphone.



Modern day gold mine

One ton of mobile phones yields more gold than one ton of gold ore. Tech companies are cashing in on this gold mine by rolling out recycling programs. Apple's recycling program reaped almost a ton of gold in 2015. In 2018, Apple debuted a robot called 'Daisy' that can disassemble up to 200 iPhones an hour.

The USGS National Minerals Information Center reported that there was no commercial production of tungsten in the United States between 2015 and 2019.

Significant tungsten deposits occur in Alaska, Arizona, California, Colorado, Idaho, Montana, North Carolina, New Mexico, Nevada, Texas, Utah, and Washington.

https://www.usgs.gov/news/usgs-updates-mineral-database-tungsten-deposits-united-states?qt-news_science_products=1#qt-news-science-products

Tungsten



Light bulbs



Microwaves



Fishing sinkers



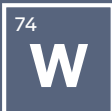
Televisions



Heating elements



Darts



Tungsten

Did you know?

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.

Copper



Electrical wiring
Compressors

Titanium

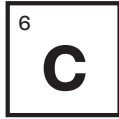


Paint and some finishes

Steel used to build appliances



Iron



Carbon



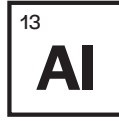
Zinc

Mining makes the products that make every day possible



The exterior of your refrigerator is made of sheet metal and the cooling system relies on copper which is soft enough to wrap into small spaces.

Aluminum



Condenser
Fan blades

Stainless steel



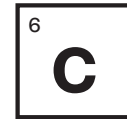
Iron



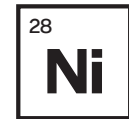
Chromium



Silicon



Carbon



Nickel



Manganese

05

Appliances

Lost Sock Index

Scientists devised a 'Sock Loss Index' in 2016 to find out why socks go missing in the wash. This formula $(L(p \times f) + C(t \times s)) - (P \times A)$ explains why Americans lose on average 1.3 socks a month. Unsurprisingly it's down to the complexity and care taken while doing laundry. The research was clever marketing by an appliance company.

Tin



Magnets



Pewter



Tin cans



Solder



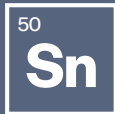
Touchscreens



Dye



Metal bearings



Tin

Did you know?

The Academy Award'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.

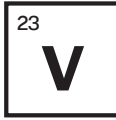
Car body and chassis made from strengthened steel and aluminum alloys



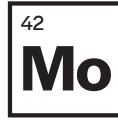
Iron



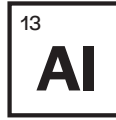
Manganese



Vanadium



Molybdenum

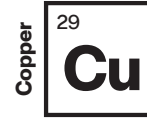


Aluminum



Magnesium

In 1899, 90% of New York City's taxi cabs were electric vehicles.



Connectors
Brakes
Bearings

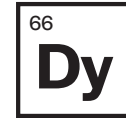


LCD screens
Windscreens

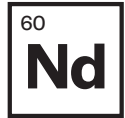
Mining makes the cars of today and tomorrow possible



Magnets in EV motors



Dysprosium



Neodymium

EV batteries



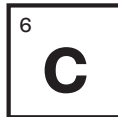
Lithium



Cobalt



Nickel



Carbon

06

Electric cars

Electric cars aren't new

London inventor Thomas Parker designed and built the first practical electric car in 1884. In the 19th and early 20th centuries, electric cars fueled by high-capacity rechargeable batteries were the most popular cars on the road. It wasn't until a more advanced combustion engine and the expansion of highways that sales dropped off.

Sodium



Fertilizers



Table salt



Food preservation



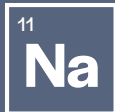
Streetlights



Baking soda



Road salt



Sodium

Did you know?

Humans can overdose on salt. A 19-year-old man accepted a dare to chug a bottle of soy sauce in 2013. The flood of excess sodium caused his brain to lose water, landing him in a coma. Doctors flushed the salt from his system, saving his life.

Zirconium

40

Zr

Engine protection

Silver

47

Ag

Navigation equipment
Radio equipment

Bismuth

83

Bi

Optics (lenses)
Ammunition

The maximum speed without external stores of the Lockheed Martin F-22 Raptor is approximately Mach 1.8 at military power and greater than Mach with after burners.

Manganese

25

Mn

Batteries
Ship building
Jet engines

Chromium

24

Cr

Aircraft
Missiles
Engines

Germanium

32

Ge

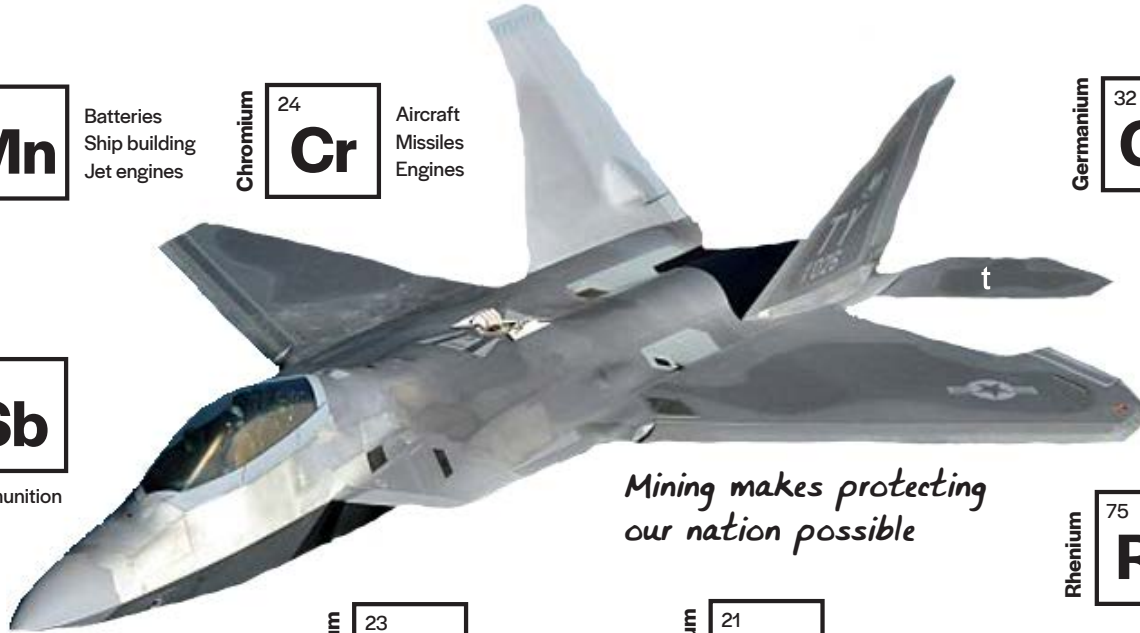
Fiber optics
Infrared optics
Electronics

Antimony

51

Sb

Ammunition



*Mining makes protecting
our nation possible*

Rhenium

75

Re

Exhausts
Turbine fans

Vanadium

23

V

Armor plating

Scandium

21

Sc

Jet aircraft
Missiles

07 Defense

Fighter pilot futuristic tech

American fighter pilots will wear custom-made, augmented reality helmets worth \$400,000 each. Made of Kevlar and carbon fiber, the helmets are packed with electronics that project data inside the visor. Vision from sensors located around the aircraft allow pilots to effectively see 'through' the jet.

Silver



Mirrors



Jewelery



Medicine



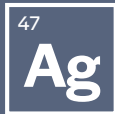
Water purification



Solar panels



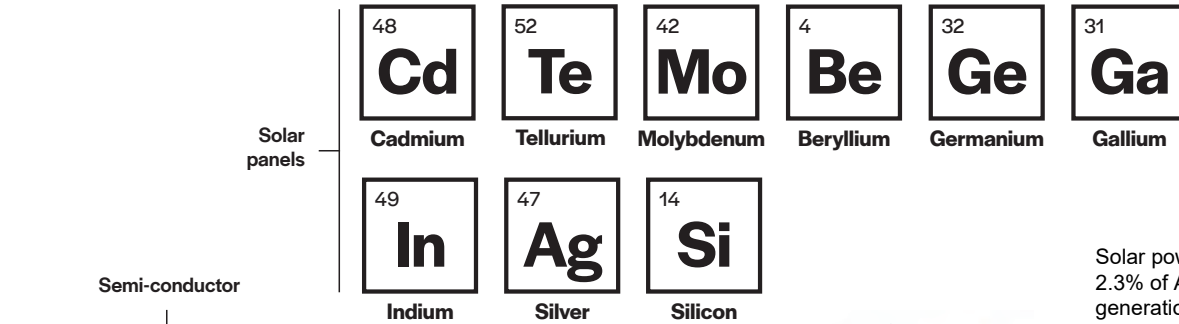
3D printing



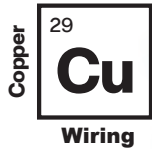
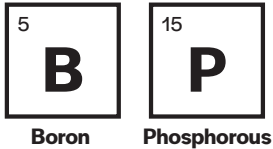
Silver

Did you know?

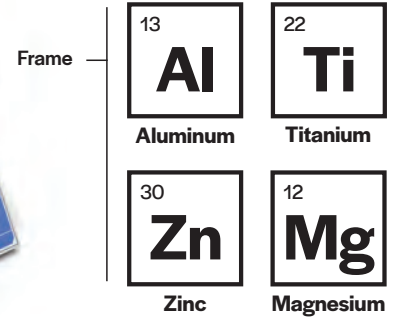
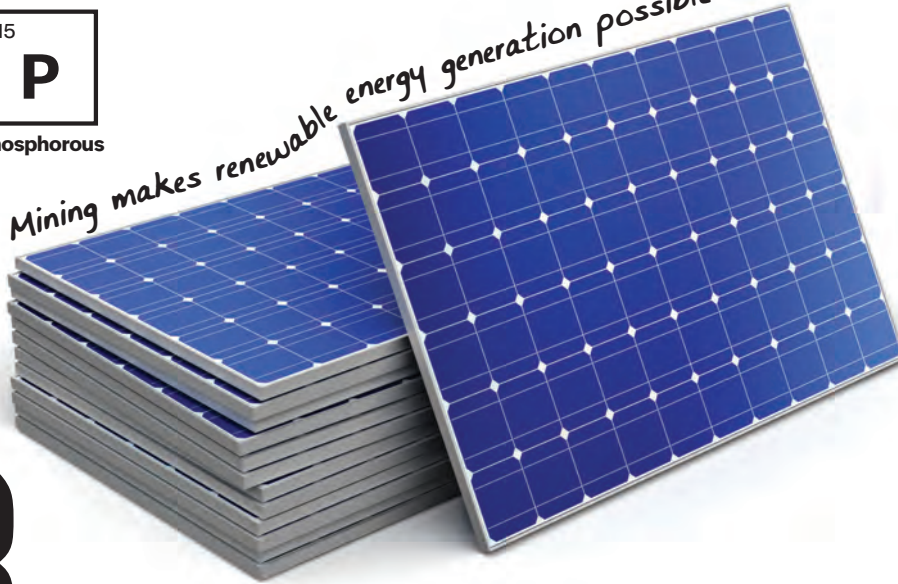
Silver has been used for centuries in medicine because of its antibacterial properties. It remains a wound management agent today, especially for burn patients. Unlike manufactured antibiotics, bacteria do not develop an immunity to silver.



Solar power accounts for approximately 2.3% of America's total electricity generation.



Mining makes renewable energy generation possible



08 Solar panels

Solar energy powering mining

From a spotlight on the American flag to powering data monitoring at a Colorado mine remediation site, solar power energy combines with battery storage applications with PV modules that have a 25-30 year life-span.

Silicon



Pottery



Computers



Sealants



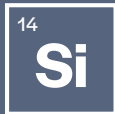
Glass



Solar panels



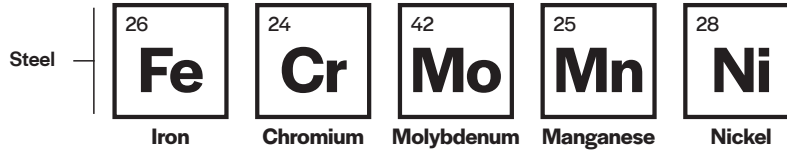
Cooking utensils



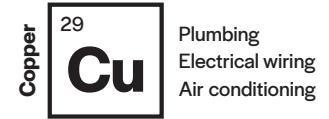
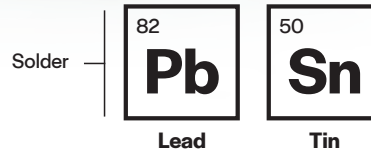
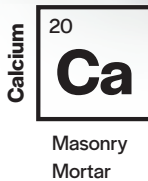
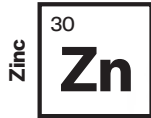
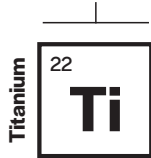
Silicon

Did you know?

Silicon is never found in its natural state, but rather in combination with oxygen as the silicate ion. Silica sand or quartz sand is made of silicon dioxide (SiO_2). Sand is plentiful, easy to mine and relatively easy to process -- it is the primary ore source of silicon. The metamorphic rock, quartzite, is another source.



House paint



2021 Single-family home sales in the U.S. are up over 4% since December 2020 and 19% since January 2020.

09

Your house

Building blocks

Besides cement and gypsum, bricks and tiles, your house requires metals for nuts and bolts, nails and screws, pipes and wiring which all come from mined metals.

Rare earths



Speakers



Wind turbines



Telescopes



MRI screening



Hybrid cars



Magnets

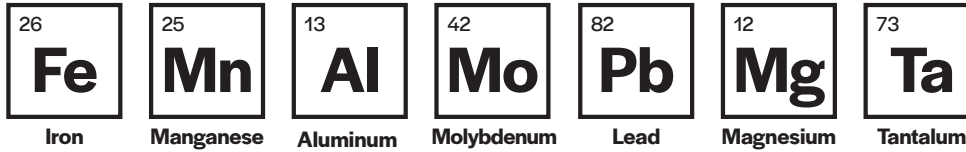


Rare earths

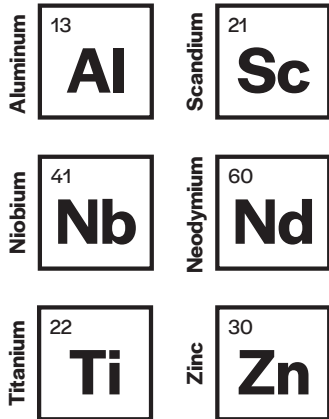
Did you know?

Modern rare earth separation processes used today were developed around the time of WWII. The Manhattan Project drove the development of the ion exchange method which made it possible to extract plutonium for atomic bombs.

Trains, trams, buses and taxis



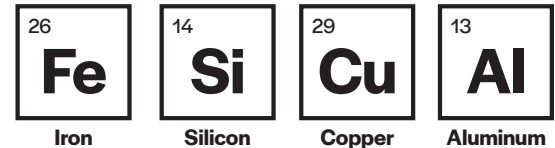
Aircraft



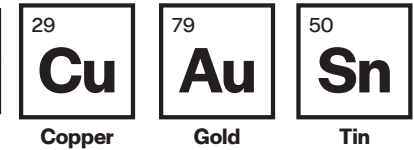
Mining makes getting where you need to go possible



Air conditioning



GPS and electronics



10 Public transport

The New York City Subway System

covers 245 miles. The Chicago "L" has about 222 miles of track and 147 stations. The D.C. Metro system which began operations in 1976, operates over a network of six lines, 91 stations, and 117 miles of track. Five U.S. cities including New York, Boston, Washington, D.C., and San Francisco have the largest, most extensive public transit systems in the country.

Potassium



Fertilizer



Detergents



Salt substitute



Glass



Match heads



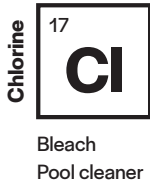
Saline drip



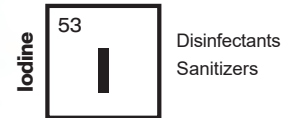
Potassium

Did you know?

Potassium is radioactive and at the same time, vital to good health. Loaded with potassium, bananas are among the most radioactive foods. Background radiation is naturally occurring and small amounts are not harmful to humans.



Mined products make clean-up easier



11 Cleaning products

Natural products

Salt has been used as a natural scourer since medieval times. Natural acids can keep your metal pots and pans shining.

Platinum



Surgical tools



Jewelery



Catalytic converters



Polish



Solar panels



Dentistry

78

Pt

Platinum

Did you know?

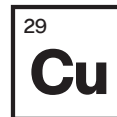
Platinum is among the most prized metals in the world, but that wasn't always the case. When the Spaniards first found the grey-white metal in Colombia in the 18th century they derided it as impure and named it 'platina', which means 'little silver'.



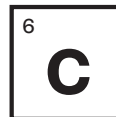
Mining makes American landmarks possible

High pressure sodium vapor lamps illuminate the bridge. They are made from an amalgam of metallic sodium and mercury.

Electrified rail lines

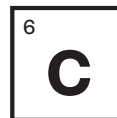


Copper

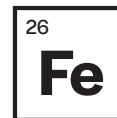


Carbon

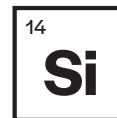
Steel beams and supports



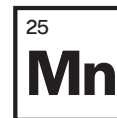
Carbon



Iron



Silicon



Manganese

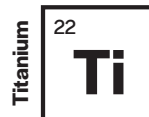
Fireworks



Glitter



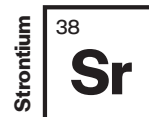
Smoke



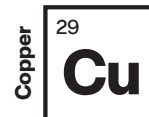
Whites



Greens

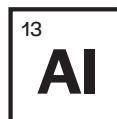


Reds



Blues

Flag pole



Aluminum



Zinc

12 The Golden Gate Bridge

Building the bridge

Steel for the Golden Gate Bridge, constructed from 1933-1937, was fabricated by Bethlehem Steel at its foundries in Pennsylvania and New Jersey. Galvanized cable was manufactured by Roeblings in Trenton, New Jersey. Materials were shipped through the Panama Canal.

Nickel



Food processing



Guitar strings



Coins



Marine engineering



Electronics



Kitchen sink

28

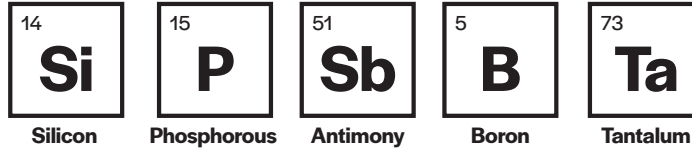
Ni

Nickel

Did you know?

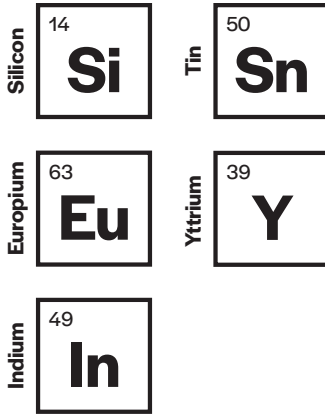
A bottle of Coca-Cola could be bought for a nickel in the United States between 1885 until well into the 1950s. The company was committed to the fixed five cent price, largely because its vending machines only accepted nickels.

Computer processors

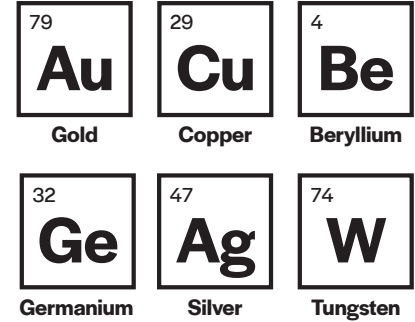


22 billion devices were connected to the internet in 2018. There were approximately 50 billion connected in 2020.

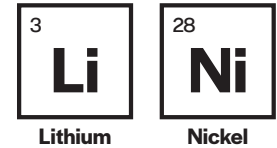
LCD screens



Circuit boards



Batteries



13 iPads & Xboxes

Almost all components of an iPad are extracted from the earth by mining. The natural resources that are mined from the earth are: Graphite, Lithium, Gold, Silver, Copper, and Nickel.

Molybdenum



Petroleum refining



Armor



Heaters



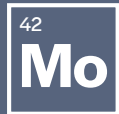
Saw blades



Nuclear reactors



High rise buildings



Molybdenum

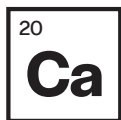
Did you know?

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.

Toothpaste



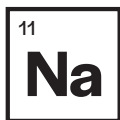
Flourine



Calcium

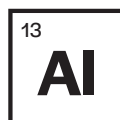


Aluminum



Sodium

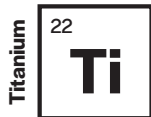
Deodorant



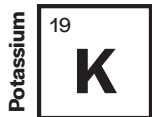
Aluminum



Zirconium



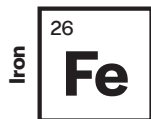
Whitening agent
in powders and
cosmetics



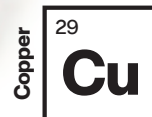
Fragrances
Tanning lotions



Suncscreens
Soaps



Cosmetic
pigment
Metal polish



Electric shavers
and toothbrushes



Anti-caking (talc)
Used in foundations,
powders and creams

Mining makes the abrasive in your toothpaste possible



14 Personal hygiene

Interestingly, Americans spend the most money on hair and skin care products and the least on oral hygiene products.

Ancient cosmetics

Humans have been enhancing their appearance for thousands of years. In ancient Egypt, women lined their eyes with kohl (antimony sulphide). In Greece, women sought out lead carbonate to make their complexion pale. By 3000 B.C., men and women in China stained their fingernails. Well manicured nails reflected status.

Mineral sands



Fiber optics



Aircraft engines



Pharmaceuticals



Car paint



Sporting goods



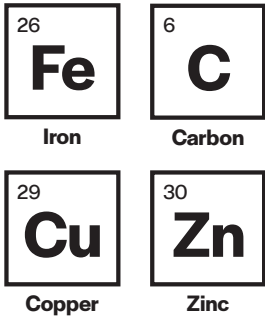
Mineral sands

Did you know?

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

During World War II the penny was made from steel mixed with zinc to conserve copper for weapons and shell casings. Today all pennies are primarily copper-plated zinc.

Coin press robotics



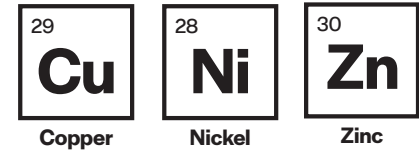
Investment metals



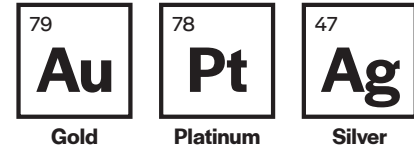
Mining makes the exchange of goods and services possible



U.S. 5, 10, and 25 cent coins



Collector coins



15 Currency

Making Money

U.S. coins are made from a variety of metals including copper, nickel, and zinc. Silver-colored coins, the quarter, nickel and dime are made using a copper-nickel combination. In the past, only the faces of the coins were plated, which caused the coins to rust. Today steel is added in the making of all coins.

Manganese



Magnet



Deoxidizer



Fertilizer



Animal feed



Steel



Colorant



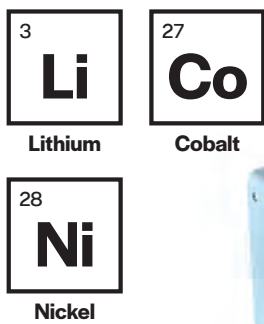
Manganese

Did you know?

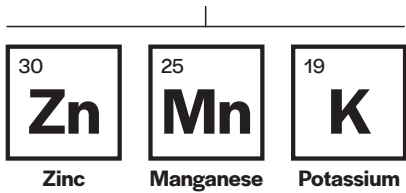
Manganese is important for good health and exists in some of the foods we eat. Too much environmental manganese can have a negative impact however, causing body tremors, aggression and delusions known as 'manganese madness'.

16 Batteries

Electric vehicle batteries



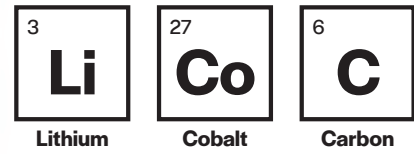
Alkaline batteries e.g. toys and electronics



Silver-oxide batteries for watches, calculators



Lithium-ion batteries for mobile phones



Lithium batteries can be composed of:

- Lithium Iron Phosphate
- Lithium Manganese Oxide
- Lithium Cobalt Aluminum Oxide, Lithium Titanate

Lead



Lead acid car batteries

Battery-powered telephone

French scientist Georges Leclanché invented a battery consisting of a zinc anode encompassed by a magnesium dioxide cathode which was used to power early telephones. The dry cell battery was good for intermittent use – long conversations would run the battery down and the conversation would become inaudible.

Magnesium



Aircraft



Fireworks



Cameras



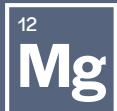
Laxatives



Power tools



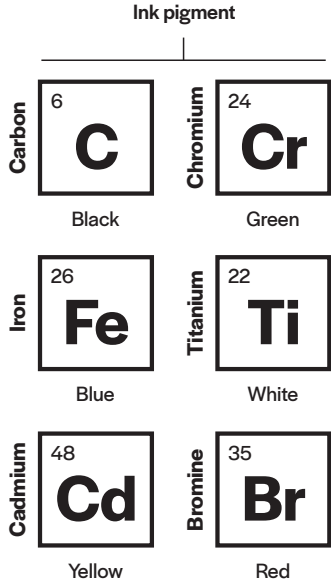
Racecars



Magnesium

Did you know?

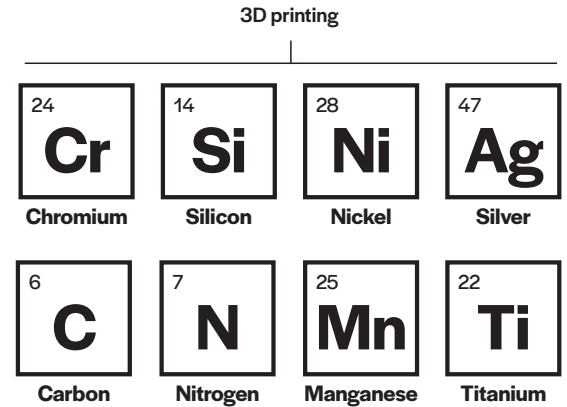
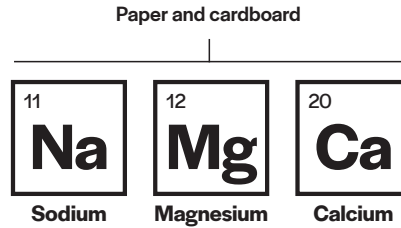
Epsom Salts originated from natural springs discovered in 1618 by cow-herd Henry Wicker in Epsom, England. The water's healing properties led physician and botanist Nehemiah Grew to extract the magnesium sulfate for medicinal purposes in 1695.



Mining makes printed products possible



Pen tips



Times New Roman font uses 27 percent less ink than Arial font

17 Commercial printing

Printing Presses

Handlever printing presses by the J.F.W. Dorman Co. of Baltimore, Maryland were built in the 1880s from cast iron and steel.

Lithium



Armor plate



Lubricant



Batteries



Mental health



Industrial drying



Pacemaker



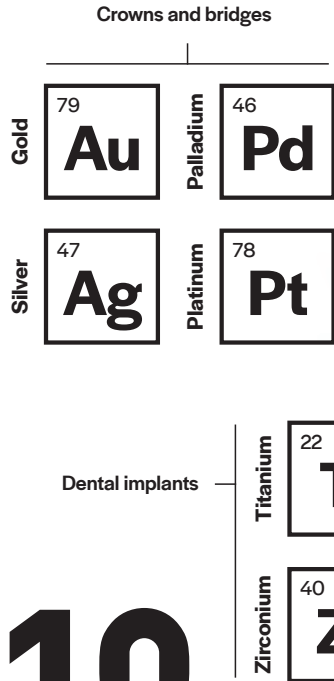
Lithium

Did you know?

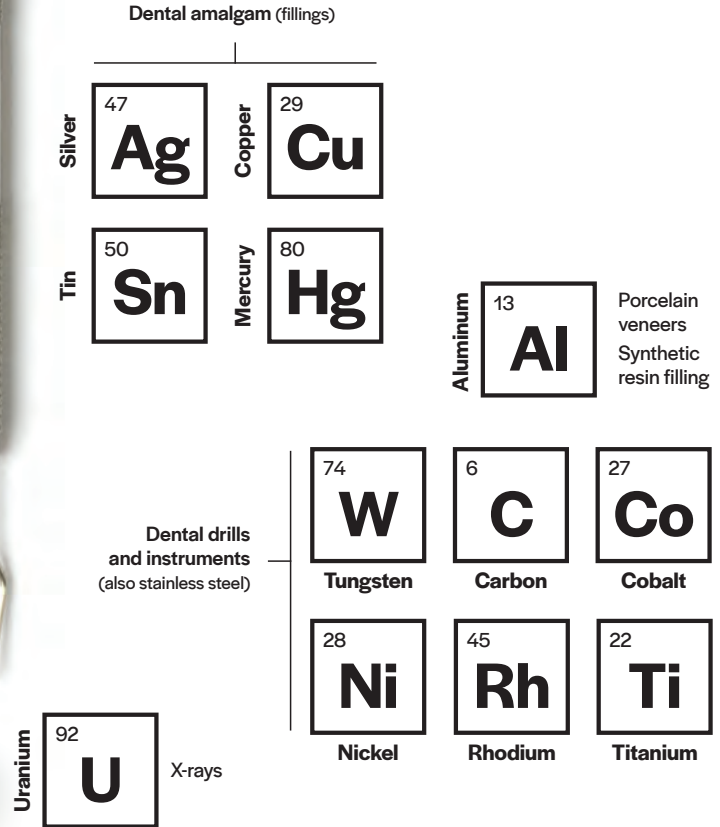
An Australian POW discovered the medicinal power of lithium in 1949. Dr. John Cade survived three and a half years at Changj before returning to his work in Australia where he successfully treated patients after noting the calming effects on guinea pigs.

18

Dentistry



Mining makes good dental health possible



Tooth extraction with a shave?

Barbers were just as likely to pull a rotten tooth as offer a shave or a hair cut during the Middle Ages. Tooth extractions were performed by barber surgeons' as part of routine hygienic services. The red and white barber's pole even represented bloodletting – the white stripe represented the bandage used to stem the blood.

Almost 19 tons of gold were used by dentists globally in 2017.

Lead



Ammunition



Car batteries



Roofing



Radiation shield



Ceramics



Solder

82

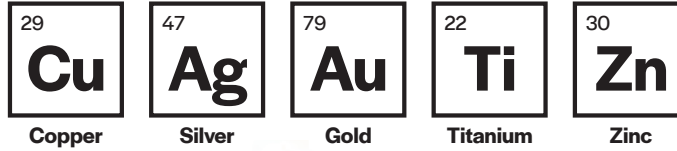
Pb

Lead

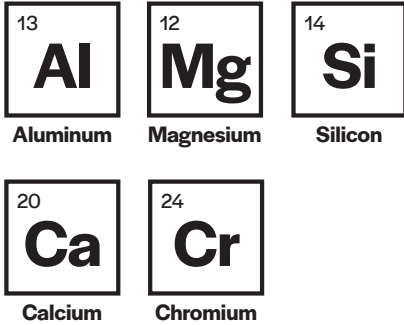
Did you know?

Queen Elizabeth I of England was a famous proponent of Venice Ceruse, a vinegar and lead cosmetic used to achieve the white-faced look popular in the 16th century. Lead poisoning no doubt contributed to her hair loss and bad skin.

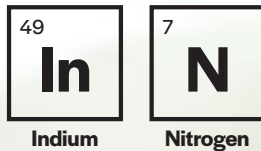
Coffins
and urns



High temperature refractory cremator bricks



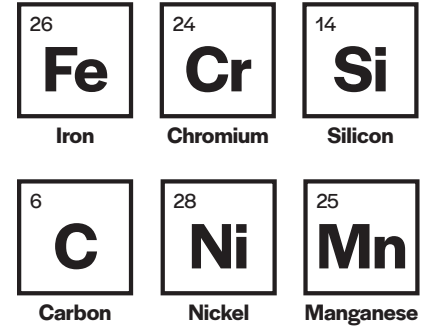
Cryogenic procedures



Mining makes every stage of life possible



Stainless steel used in crematoriums



Recycling post-mortem

Titanium, gold, silver and platinum are some of the metals from dental work and artificial joints not destroyed during a cremation. Crematoriums can choose to recycle these metals, shipping them free of charge to a company in the Netherlands. Local crematoriums then receive a percentage of the revenue, which they usually donate to charity.

19 Funerals

Over 1 million joint replacements occur annually in the U.S.

Iron



Whitegoods



Public transport



Cities



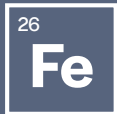
Roads & bridges



Manufacturing



Cars & trucks



Iron

Did you know?

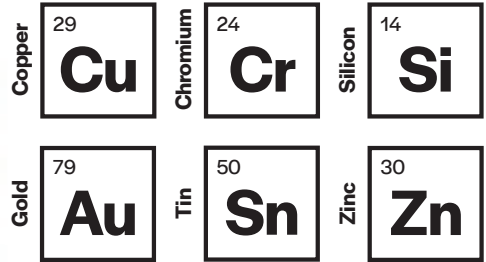
A deep-sea snail has evolved a suit of armor made from iron sulfide – the only animal on earth that uses iron this way. The scaly-foot gastropod was discovered in 2001 and lives in the hydrothermal vent fields of the Indian Ocean.



Sound bars and speakers



Television electronics



Oscar statuette



The Avengers: End Game was the highest grossing movie in the U.S. for 2019. Bad Boys for Life topped the list for 2020.

20 Film & television

The U.S. could not manufacture TVs without importing minerals. At least six of the necessary minerals are 100% imported: Tantalum, Strontium, Niobium, Mica, Manganese, and Indium.

Indium



Touchscreens



Microchips



Protective eyewear



LCD televisions



Solar panels



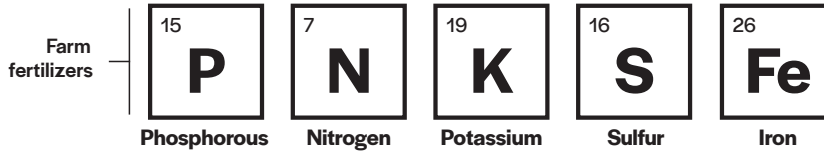
Fire sprinklers



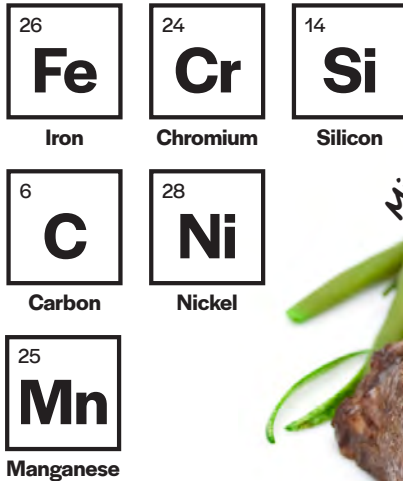
Indium

Did you know?

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.



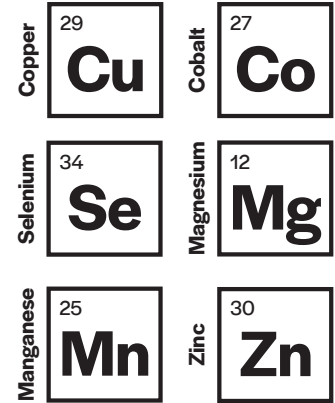
Vegetable storage and distribution



Mining makes healthy living possible

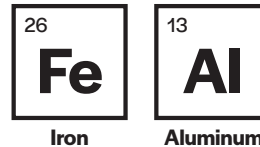
Around 20-40% of 'ugly' fruit and vegetables is rejected before it reaches the supermarket.

Stock feed nutrients



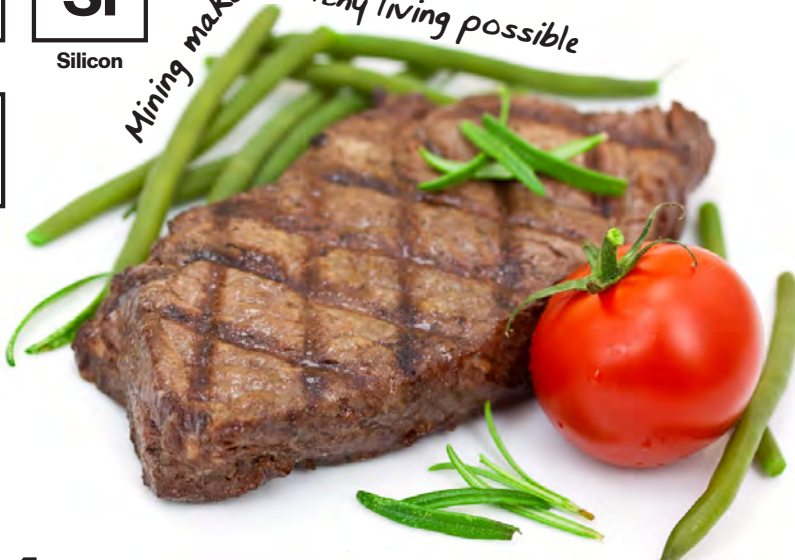
21 Meat & veggies

Tractors and harvesters



Made fresh in America

Today's refrigerated trucks, trailers and rail cars are equipped with microprocessors programmed to control the operation of the unit so that both refrigeration and fuel efficiency are maximized.



Gold



Awards



Investment



Electronics



Jewelry



Hi-tech health



Aerospace

79

Au

Gold

Did you know?

Ecuador's Jivaro tribe were so excessively taxed by the Spanish governor in 1599 they poured molten gold down his throat. The Romans and enforcers in the Spanish Inquisition are also believed to have killed using molten gold – an effective, albeit brutal, means of execution.



Mining makes protecting your home possible

Thermal imaging home security cameras



Silicon



Indium



Germanium



Antimony

Fire sprinklers



Bismuth



Lead



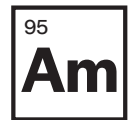
Tin



Cadmium

Smoke detectors

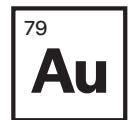
Americium



Silver



Gold



Lithium

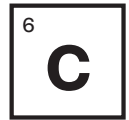


Home safe

Iron



Carbon



Homes without a security system are 300% more likely to be broken into and burglarized (Alarms.org). 46.9% of people don't have a security system installed in their homes (TheZebra.com).

22

Home protection

Fire extinguisher



Aluminum



Phosphorus

Automatic Fire Sprinklers

work quickly to get a fire under control and prevent the spread of deadly smoke and gases, such as carbon monoxide. One activated sprinkler can extinguish a residential fire in less than a minute. The best piping material for a residential sprinkler system is the same reliable copper tubing that has been used in plumbing for more than 70 years.

Diamond



Jewelry



Mining exploration



Drill bits



Polishing powder



Cement cutting



Knife sharpener



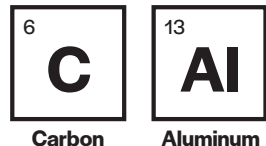
Gemstones

Did you know?

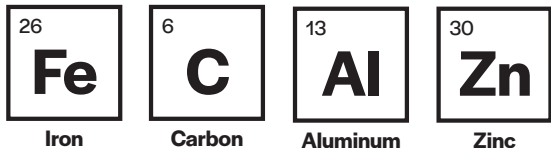
Scientists discovered a planet made of diamond in 2004. Orbiting a star in the Milky Way, 55 Cancri e is believed to be composed of diamond and graphite. Twice the size of earth, the planet moves so fast, a year there lasts just 18 hours.



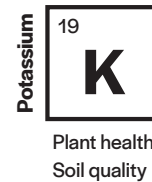
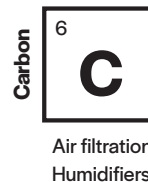
Water desalination
Nanofibre membrane
technology



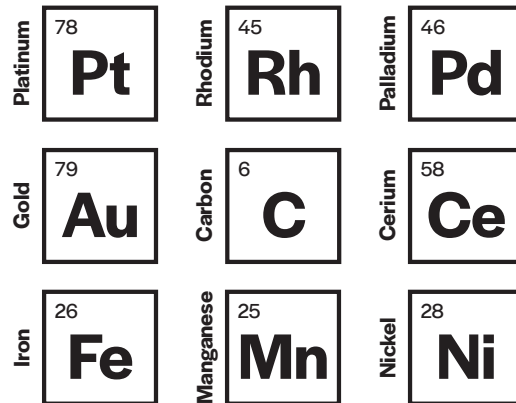
Carbon capture and storage



Mining makes science to save the planet possible



Catalytic converters Reduce vehicle and other emissions



Nonoscale metal blends area used to break down contaminants in groundwater.

23 Environmental solutions

Metal-organic frameworks

Researchers from CSIRO, Monash University and the University of Texas have developed a desalination membrane that separates salt and lithium from seawater. Metal-organic frameworks (MOFs) are a next generation material that filters chemical compounds, making seawater safe to drink and recovering lithium for use in batteries.

Copper



Electrical wiring



Circuit board



Plumbing



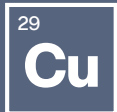
Homewares



Instruments



Electric cars



Copper

Did you know?

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 BC. Ancient Egyptians believed copper was sacred and gave its wearer magical powers.



Metals to Medals

The gold, silver, and bronze medals for the Vancouver 2010 Olympic and Paralympic Games were the first Olympic medals to contain recovered e-waste!

Gold medals are not made of solid gold -- they are made by placing a layer of gold (7.5%) on a silver base (92.5%).

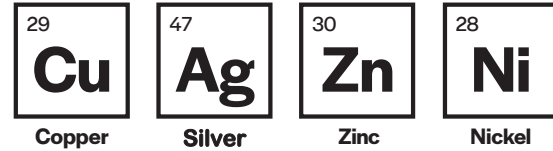
Silver medals contain 7.5% copper because pure silver is too soft for the medals.

Bronze (an alloy of copper and tin) medals are made mostly of copper.

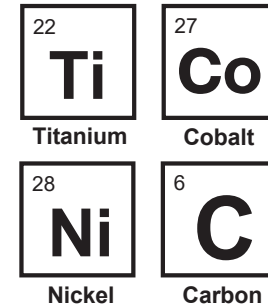
Nearly one ton of copper was used in the production of all 2010 Olympic medals.

The Stanley Cup

Made of silver-nickel alloy



The most advanced ice hockey sticks are made from graphite and are manufactured with precise flex patterns that allow for more accuracy and power when hitting the puck. Exotics such as Kevlar and titanium are also used, and occasionally coatings such as nickel cobalt are applied for added strength.



Since 1958, five bands of championship names are engraved around the base of the Stanley Cup. Those bands are detachable and allow the NHL to add more names each season. It is estimated that each name will remain on the Stanley Cup for approximately 50 years before the band is removed. The current cup stands at 35.25 inches and weighs 34.5 pounds.

24 Sports Championships

Cobalt



Batteries



Electric cars



Ceramics



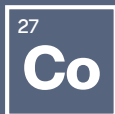
Wind turbines



Medical tracers



Jet engines



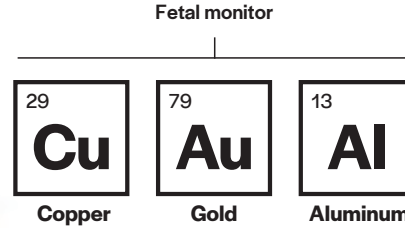
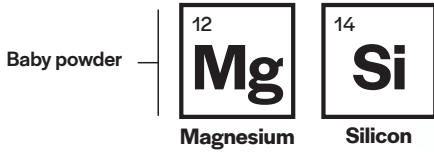
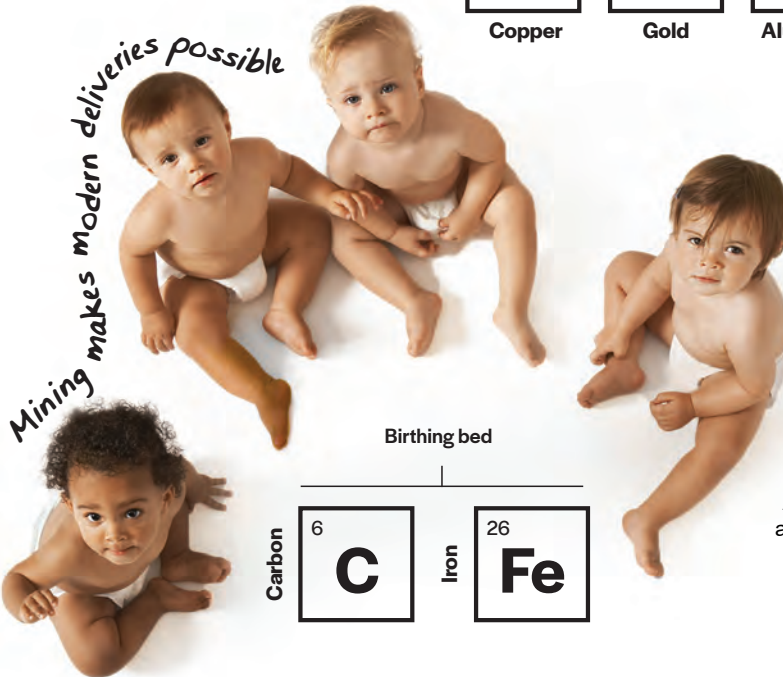
Cobalt

Did you know?

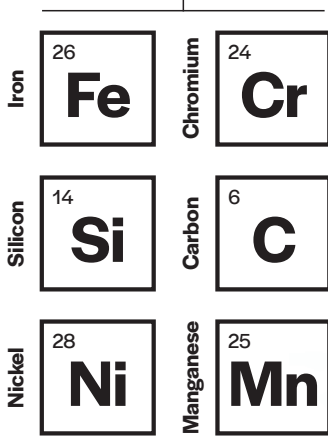
Cobalt was named after the German word for goblin, *kobold*, by superstitious miners who believed it was responsible for mysterious deaths. They were right. Toxic vapors during smelting made this a dangerous ore for medieval miners.

25

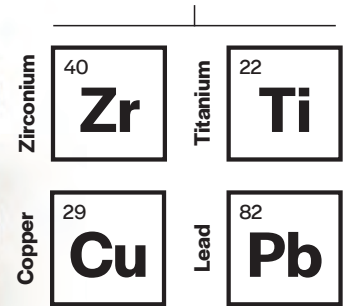
Birthing suites



Forceps, clamps and other surgical instruments



Ultrasound machine



Birthing bed



According to the United Nations, approximately 385,000 babies are born world-wide every day.



Humidicrib invention

Tasmanian brothers Edward and Don Both invented the humidicrib in the late 1930s. Poliomyelitis was at epidemic levels and the portable device was an inexpensive alternative to the 'iron lung'. Today the humidicrib is used in hospitals across the globe and has helped save the lives of millions of premature babies.

Coal



Electricity



Cement



Carbon fiber



Wind turbines



Water filtration



Steel



Carbon

Did you know?

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.



Copper



Aluminum

Brewing kettle

Stainless steel equipment, pipes, storage



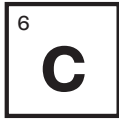
Iron



Chromium



Silicon



Carbon



Nickel



Manganese

Brass fittings and valves



Copper



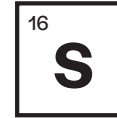
Zinc



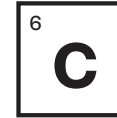
Mining makes brewing and bottling possible

Craft breweries need minerals for all their supplies: Malt mill, Mash tun, Filtration systems, Heat exchanger, Hydrometer refractometer, Brite Tank, Pumps and Valves.

Amber glass bottles



Sulfur



Carbon



Iron

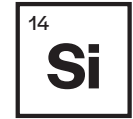
Green glass bottles



Iron

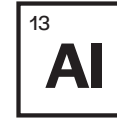


Chromium

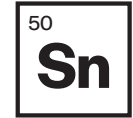


Silicon

Beer cans



Aluminum

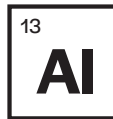


Tin

26

Brewing beer

Aluminum



Beer tops

A short history of bottling

Commercial bottling is believed to have started in the latter part of the 17th century, but it wasn't until after World War I that demand for bottled beer soared. Early manufacturers struggled making glass bottles strong enough to withstand the carbonation. Producers eventually worked out that longneck beer bottles were the solution.

Chromium



Utensils



Leather tanning



Chrome plating



Wood preservation



Fireworks



Dyes & inks



Chromium

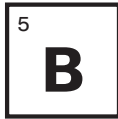
Did you know?

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.

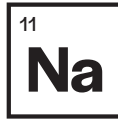
Optical glass in telescopes, microscopes, binoculars and camera lenses



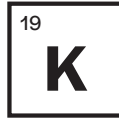
Silicon



Boron



Sodium



Potassium



Tantalum

Mirrors



Silicon



Boron



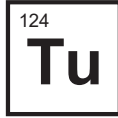
Aluminum



Manganese



Fluorine

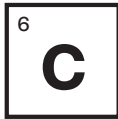


Teslium

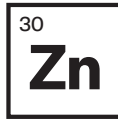
Hardware components



Iron



Carbon



Zinc



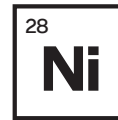
Aluminum



Mining makes reaching for the stars possible

The new James Webb Telescope is a successor to the Hubble Space Telescope and will allow us to continue observing our galaxy and beyond.

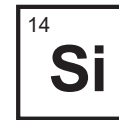
Digital camera batteries



Nickel



Lithium



Silicon

27 Lenses & telescopes

Hubble Telescope

The Hubble Space Telescope orbits around 340 miles above Earth, traveling more than 3.7 billion miles since it launched in 1990. It has recorded more than 1.3 million observations for astronomers and moves at a speed of 16,950 mph. After years of amazing photographs, the Hubble Telescope will soon be retired.

Boron



Tile glazes



Rocket propellant



Fireworks



Laundry Detergent



Pool cleaner



Eye drops

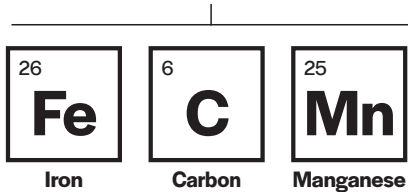


Boron

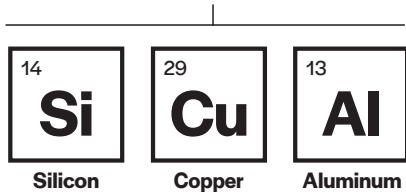
Did you know?

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.

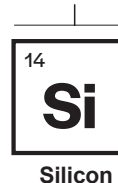
Railway tracks



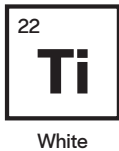
Traffic lights



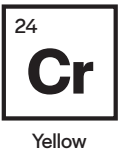
Railroad crossing cat eye reflector



Titanium

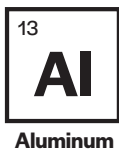


Chromium

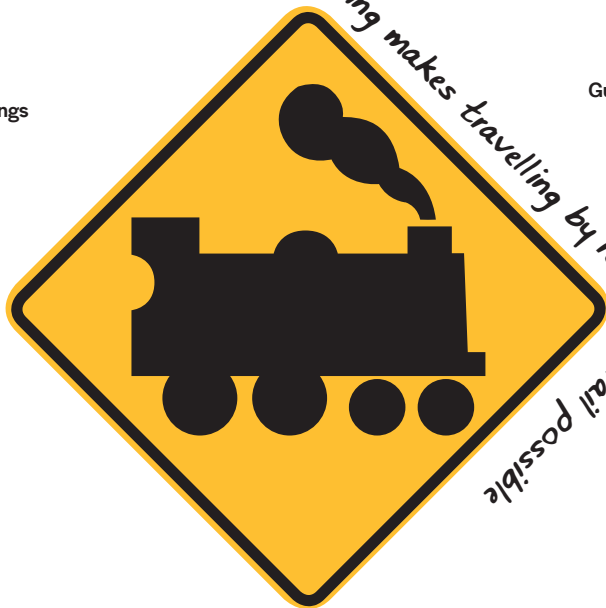


Road markings

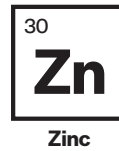
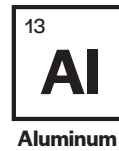
Road signs



Mining makes travelling by road and rail possible



Guard rails



Bridges



28 Roads & rail

Golden Spike Historic Site

Authorized in 1965, the Golden Spike Historic Site (located in northern Utah) is the completion site for the first transcontinental railroad. Bernice Gibbs Anderson, a correspondent for the Salt Lake City Tribune and a mother of six, wrote almost 3,000 articles from the 1920s to 1960s - in addition to press releases and letters to U.S. Park Service officials, members of Congress and the President encouraging that the site be preserved. In 2019, a couple of months before the 150th anniversary of the railroad completion, the site was redesignated as a national historical park.

Antimony



Batteries



Fire retardant



Ammunition



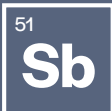
Cable sheathing



Paint



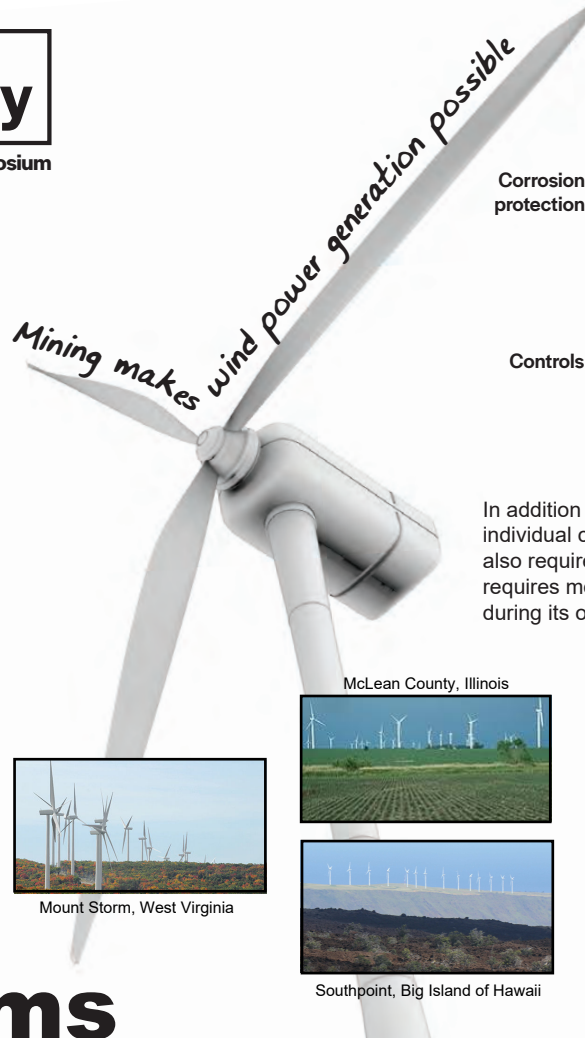
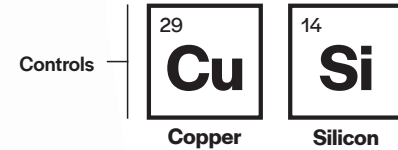
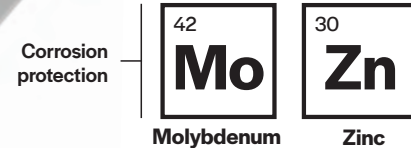
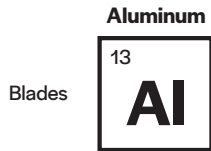
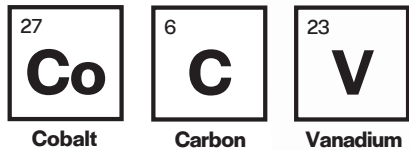
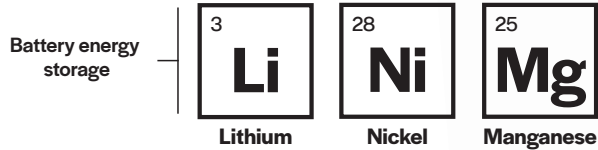
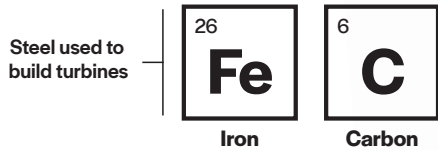
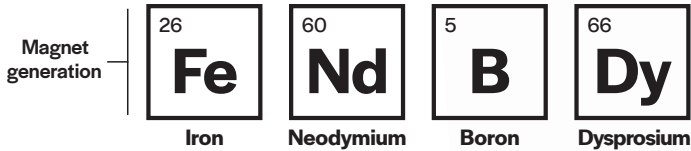
Fireworks



Antimony

Did you know?

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.



In addition to the minerals required for individual components, wind turbines also require the use of steel, which requires more than 240 tons of coal during its own manufacturing process.

McLean County, Illinois



Mount Storm, West Virginia



Southpoint, Big Island of Hawaii

In 1980 the world's first wind farm, consisting of twenty 30 kW wind turbines was installed at Crotched Mountain, in New Hampshire. From 1974 through the mid-1980s, the U.S. government worked with industry to advance the technology and enable large commercial wind turbines.

29 Wind farms

Aluminum



Aircraft



Canned food



Transport



Housing



Cookware



Bicycles

13

Al

Aluminum

Did you know?

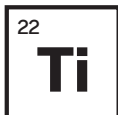
Life Savers and Toblerone chocolate bars were among the first commercial uses of aluminum foil. Swiss chocolatier Tobler began wrapping bars in rolled foil in 1911. In the United States, aluminum replaced tin foil Life Saver wrappers in 1925.

Spacecraft

Shuttle body

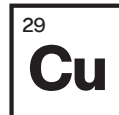


Aluminum

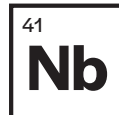


Titanium

Rocket engines



Copper

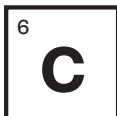


Niobium

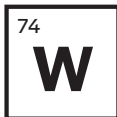
Thermal protection



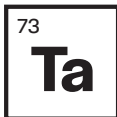
Silicon



Carbon

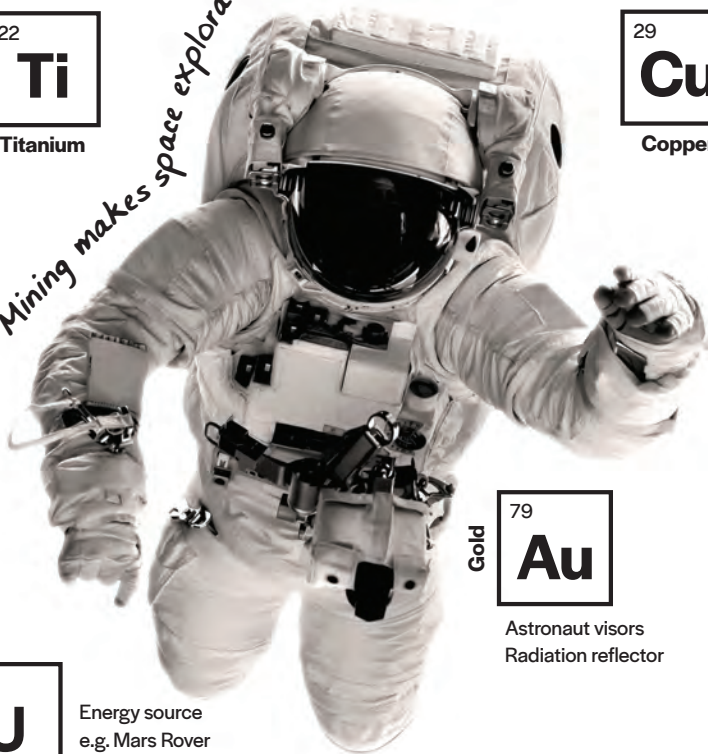


Tungsten

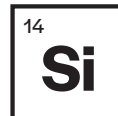


Tantalum

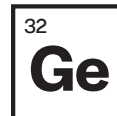
Mining makes space exploration possible



Control system

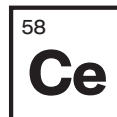


Silicon



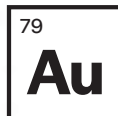
Germanium

Cerium



Optics

Gold



Astronaut visors
Radiation reflector

The International Space Station orbits Earth every 92 minutes. That's 15-16 sunrises and sunsets a day.

30



Uranium

Energy source
e.g. Mars Rover

Space travel

Golden Records of life on earth

NASA launched the Voyager Golden Records - two gold-plated copper phonograph records containing sounds and images from Earth - into space in 1977. Intended for future spacefarers or intelligent lifeforms, the records contained greetings in 55 languages and sounds ranging from rain and thunder to birds, frogs, laughter and children.

