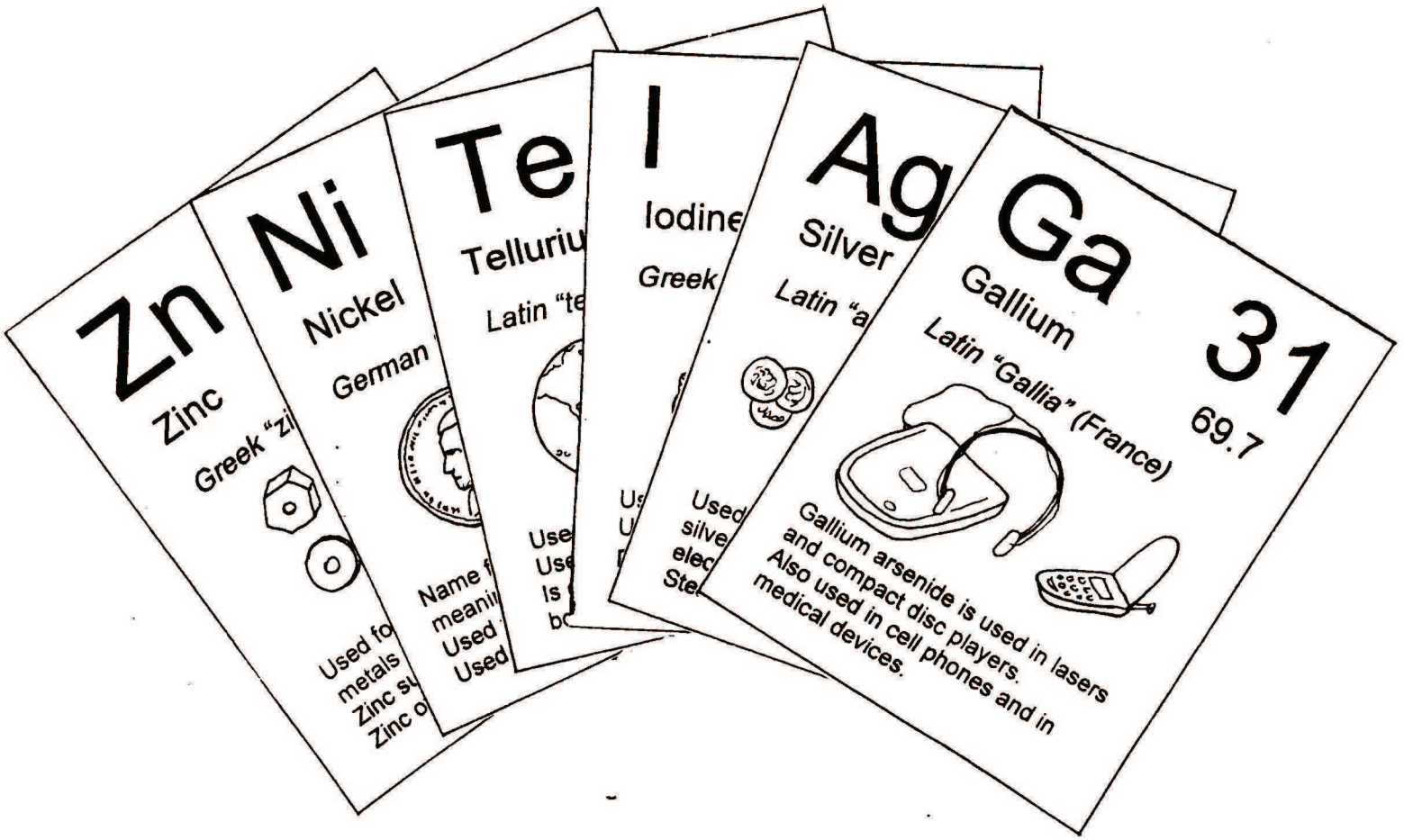
QUICK SIX

A fast-paced card game about the elements

For 2- 6 players (or even a few more)
No previous knowledge of chemistry required
Target age group: grades 4-8 (can use with younger if they can read fairly well)



"QUICK SIX"

A game about the elements

Object of the game: To be the first one to collect six cards

Set-up:

Photocopy the cards onto white card stock. Cut cards apart. Provide players with a Periodic Table to look at while playing. Make sure players know the family groups: alkali metals, alkali earth metals, transition metals, true metals, non-metals, noble gases. A Periodic Table with these families color-coded is helpful.

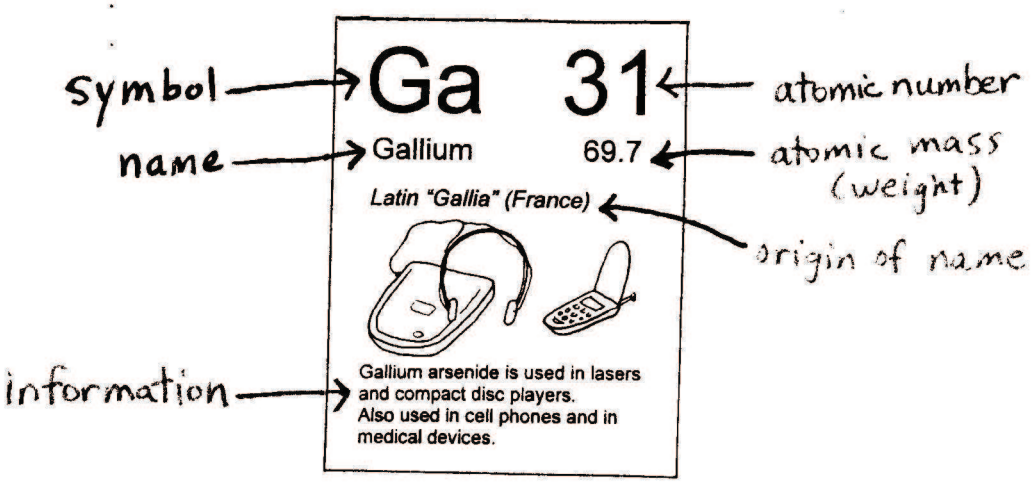
How to play:

Decide which player will be the "caller." This player must read clues from the list instead of being one of the card players. If an adult is supervising the game, this is the obvious adult job. An adult caller may want to choose particular attributes from the list below to emphasize facts recently learned. It is easiest to down the list in order, but the caller need not go in order, and may also use items from the list more than once (as long as the caller is being fair and is not purposely aiming to benefit any one card player, of course!) Feel free to add your own ideas to the list given below!

Each card player receives five cards, which he places face up in front of him. The rest of the cards go face down in a draw pile. The caller reads one of the attributes from the list (the first on the list if they are going in order). Each player looks at his five cards to see if he has a card that has that attribute. If he does, he slaps his hand down on the card. The caller looks to see who is the first player to slap his hand down. That player then shows the card under his hand. If the caller agrees that this card qualifies, then the player may remove that card from the line up and put it face down into a "keeper" pile. Then he draws a card from the draw pile to replace that card and restore him to five cards face-up.

The caller then reads off another attribute from the list and the game continues in this manner until one players has six cards in their "keeper" pile. If no player has a card that qualifies, the caller simply goes on to the next one on the list.

If you reach the end of the list below, just start over at the beginning again. Game takes 5-20 minutes to play. Often there is time to play several games in a row. You can switch callers between games if you want to.



List of clues

When you get to the end of the list start over again.

Atomic number has a 3 in it
Named has two syllables
Used in lasers
Has something to do with the color green
Named after someplace in Scandinavia
Has something to do with teeth
Named after a Greek god or goddess
Is a transition metal
Starts with the letter C
Is in the same row as gold on the Periodic Table

Used in some kind of engine
Atomic number has a 5 in it
Used to make tools of some kind
Is named after a city (not a country)
Is an alkali earth metal
Is radioactive
Name has three syllables
Is used to make jewelry
Named after a country
Used for something that burns

Is a non-metal
Atomic mass is less than 30
Named after something in the solar system
Atomic number has a 7 in it
Is on the edge of the Periodic Table
Atomic mass is between 50 and 70
Named after Ytterby, Sweden
Is a true metal (or a semi-metal, if you have those labeled)
Is named after a country (not a city)
Used in fireworks

Atomic number has three digits
Found in the sands of Florida and California
Is in the actinide series
Has something to do with bones
Name starts with a vowel
Is in the same row as molybdenum on the Periodic Table
Gemstones are made from it
Named after a famous scientist
Has an atomic number greater than that of tungsten
Used to color glass

List of clues, con't.

Name has four syllables
Atomic number has a 0 in it
Used in steel production
Used to repair the human body somehow
Is in the same column as helium on the Periodic Table
Used in light bulbs
Atomic mass is greater than 100
Is found as a gas in the air around us
Has something to do with eyes
Atomic number has a 9 in it

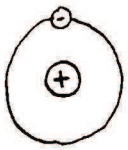
Is in the lanthanide series
Conducts electricity
Last three letters of the name are I-U-M
Is in the same row as iron on the Periodic Table
Has no commercial or scientific use
Is made in nuclear reactors
Name is from a Latin word
First letter of name does not match first letter of the symbol
Name has one syllable
Named after a female, either real or mythological

Feel free to add your own clues to the list:

H 1

Hydrogen 1.0

Greek: "hydro-gen" (water-maker)



Has no neutrons

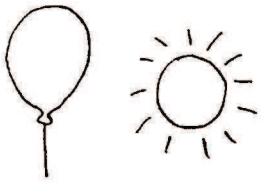
Most abundant element in the universe

Used in rocket fuel and fuel cells

He 2

Helium 4.0

Greek: "helios" (sun)



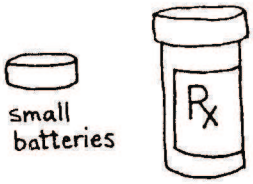
Used in balloons, blimps, and scuba diving air tanks

Discovered in the sun in 1895 using a spectrometer

Li 3

Lithium 6.9

Greek: "lithos" (stone)



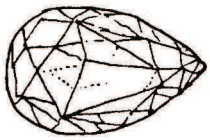
Used in batteries, lubricants, medicines, and nuclear bombs

Never found by itself in nature

Be 4

Beryllium 9.0

From the mineral "beryl"



Found in emeralds

Mixed with copper to make "beryllium bronze," an alloy that will not create sparks

B 5

Boron 10.8

From the compound "borax"

Used to make heat-resistant glass

Use to make boric acid which is used as an antiseptic eye wash

Use in nuclear power plants

C 6

Carbon 12.0

Latin: "carbo" (charcoal)

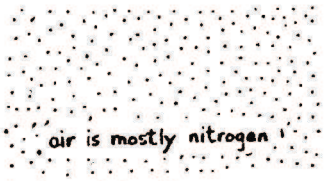
Diamonds, graphite, and coal are all made from pure carbon

Makes long chains (polymers) found in plastics, fuels, food, and living cells

N 7

Nitrogen 14.0

From nitrate compounds



Most of our air is nitrogen

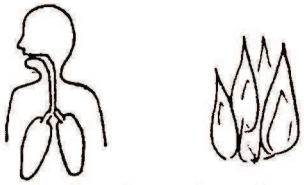
Chilled down into a liquid, it is used by doctors and scientists

Used in air bags in cars

O 8

Oxygen 15.9

"oxy" (acid) "gen" (maker)



Found in air, water, and sand

Necessary for respiration

Needed for combustion (burning)

Ozone is make of oxygen

F 9

Fluorine 18.9

Latin: "fluere" (to flow)

Found in the mineral fluorite

Put into toothpaste

Used in nuclear power plants and in industrial coolants

Ne 10

Neon 20.2

Greek "neos" (new)

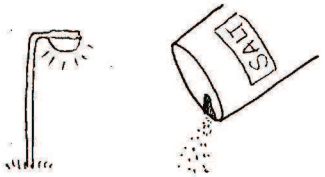
Used in neon lights, fog lights, and lasers

Never bonds to any other element

Na 11

Sodium 22.9

From soda ash



Bonds with chlorine to make table salt

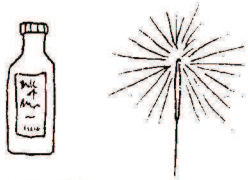
Used in street lights and in household cleaning products

Never found by itself in nature

Mg 12

Magnesium 24.3

From Magnesia, in Greece



Used in sparklers

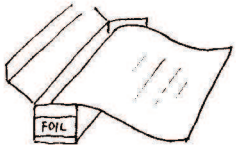
Found in Epsom salt and "milk of magnesia"

Plants and animals need it to live

Al 13

Aluminum 26.9

From the compound alumina



Used in airplanes because it is so light and strong

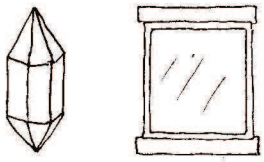
Used for foil, tubes, and cables

Used in fireworks

Si 14

Silicon 28.0

"hard stone, boulder"



Found in sand, clay, lava, glass and quartz

Used to make computer chips

P 15

Phosphorus 30.9

Greek: "bearer of light"

Used in matches, fireworks, fertilizers, and detergents

Discovered in 1669 by an alchemist (in boiled urine)

S 16

Sulfur 32.0

"stone that burns"

Found in matches and fireworks

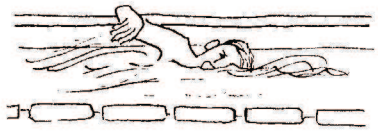
Used to vulcanize rubber

Volcanoes produce sulfur dioxide gas, which is also found in air pollution.

Cl 17

Chlorine 35.4

Greek: "chlorus" (greenish-yellow)



Bonds with sodium to make table salt

Is an ingredient in PVC plastics

Combines with hydrogen to make HCL, an acid found in your stomach

Ar 18

Argon 39.9

Greek: "argos" (inactive)

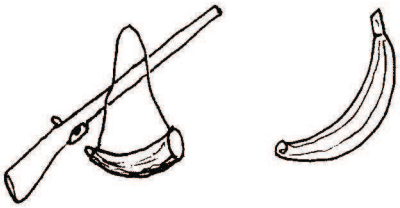
Used in lightbulbs and lasers

Does not bond or react with any other element

K 19

Potassium 39.0

From the substance "potash"

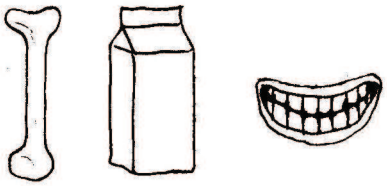


Used in fertilizers.
An ingredient in gunpowder.
Bananas contain potassium.
Can form salts, just like sodium.

Ca 20

Calcium 40.0

Latin "calx" (lime)

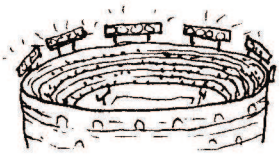


Found in chalk, limestone, plaster, concrete, bones, and teeth.
Milk contains a lot of calcium.
Calcium in water makes it "hard."

Sc 21

Scandium 44.9

Named after Scandinavia

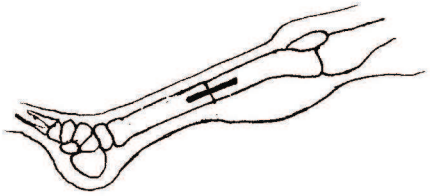


Used in stadium lights.
Used in large screen TV's.
Radioactive scandium is used as a "tracer" in petroleum refineries.

Ti 22

Titanium 47.8

Named after Greek Titan gods

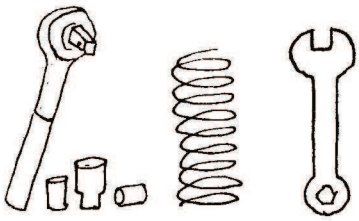


Used for pins in bone surgery.
It is lightweight and is used in airplane motors.
Is an ingredient in paint pigments.

V 23

Vanadium 50.9

Scandinavian goddess Vanadis



Used in making steel
An ingredient in metals used for tools, springs and engines.

Cr 24

Chromium 51.9

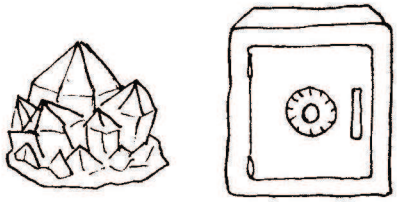
Greek "chroma" (color)

Gives rubies their red color.
Used as a coating for metals.
Used in video tape manufacture.

Mn 25

Manganese 54.9

Latin "magnes" (magnet)

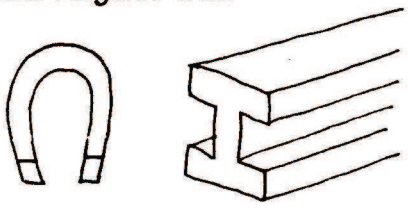


Added to steel that needs to be very strong (for uses such as rifle barrels, bank vaults, etc.)

Fe 26

Iron 55.8

Old English "iren"

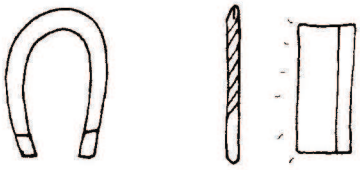


Discovered in ancient times.
Used in steel and magnets.
Found in blood cells.
Meteorites often contain iron.

Co 27

Cobalt 58.9

German "kobald" (evil gnome)

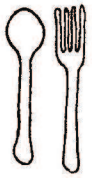


Miners used to say "kobald" lurked in the mines (and the name stuck!)
Used in "alnico" magnets.
Used in making drill bits and razors

Ni 28

Nickel 58.7

German "Nickel" (Satan)

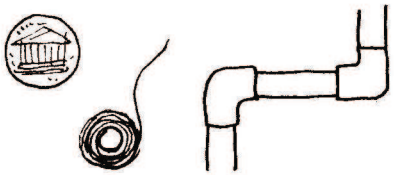


Name from "Kupfernickel" meaning "Satan's copper."
Used to color glass
Used to make coins and utensils.

Cu 29

Copper 63.5

Latin "cuprum" (from Cyprus)

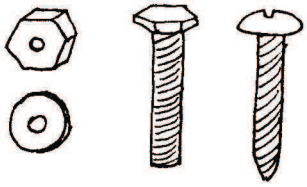


Used for coins, wires and pipes.
Statue of Liberty is made of copper
Copper mixed with zinc is brass.
Copper mixed with tin is bronze.

Zn 30

Zinc 65.4

Greek "zink"

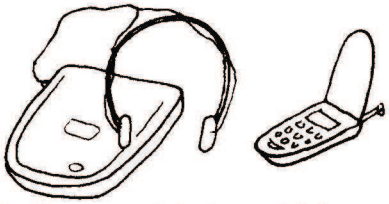


Used for galvanizing (protecting) metals such as iron and steel.
Zinc sulfide glows in the dark.
Zinc oxide is used in copiers.

Ga 31

Gallium 69.7

Latin "Gallia" (France)



Gallium arsenide is used in lasers and compact disc players.
Also used in cell phones and in medical devices.

Ge 32

Germanium 72.6

Latin "Germania" (Germany)

Is a semi-conductor, and is used in transistors.
Used in lenses and fiberoptics.

As 33

Arsenic 74.9

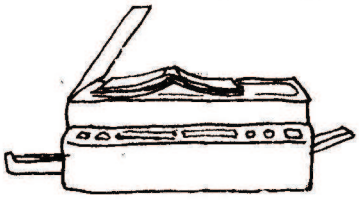
Latin "arsenicum" (a pigment)

Famous for its use as a poison.
An ingredient in weed killers and insecticides.
Used in lasers, LED's.

Se 34

Selenium 78.9

Greek "selene" (moon)

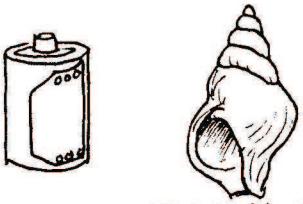


Used in photocopiers because it conducts electricity in the presence of light.
Used in robotics and light meters.

Br 35

Bromine 79.9

Greek "bromos" (stench)

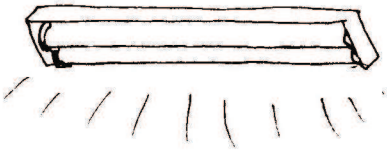


Bromine is a reddish liquid with a terrible smell.
Found in sea water, salt mines.
Used in photographic film.

Kr 36

Krypton 83.8

Greek "kryptos" (hidden)



Used in fluorescent light bulbs, especially photographic bulbs.
Used in UV lasers and atomic clocks.

Rb 37

Rubidium 85.5

Latin: "rubidus" (deep red)

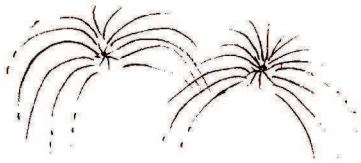
Is a by-product during the refinement of lithium and cesium

Is used as a gas scavenger (collector) in vacuum tubes

Sr 38

Strontium 87.6

Scottish village of Strontia



Used in fireworks (bright red)

Used in batteries in ocean buoys

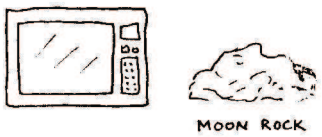
Used to produce radiation

Used to research bone structure

Y 39

Yttrium 89.9

Name after Ytterby, Sweden



Used in superconductors, lasers, and TV tubes

Rocks from the moon contain strontium

Zr 40

Zirconium 91.2

Arabic: "zargun" (gold color)

Made into gemstones

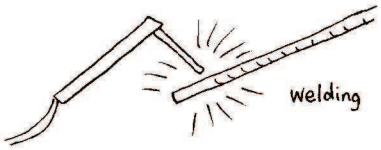
Used in catalytic converters in cars

Used for heat resistant parts in nuclear plants and space shuttles

Nb 41

Niobium 92.9

Named for Greek goddess Niobe



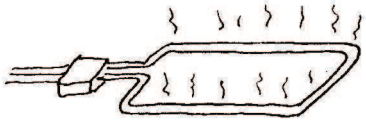
Used in welding rods, cutting tools, and superconducting magnets

Added to steel to make it heat resistant

Mo 42

Molybdenum 95.9

Named for mineral molybdenite



Used for filaments in heaters

Is an ingredient in steel used for airplane and auto engines

Large deposits found in Colorado

Tc 43

Technetium 89.9

Greek: "teknetos" (artificial)

Not found in nature

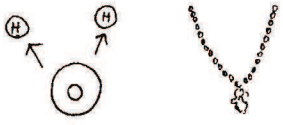
Must be made in a lab and is radioactive

It is combined with other elements and used in medical procedures

Ru 44

Ruthenium 101.0

Latin: "Ruthenia" (Russia)



Used to split water molecules

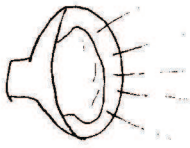
Used in jewelry industry

Often mixed with titanium and platinum to increase their hardness

Rh 45

Rhodium 102.9

Greek: "rhodon" (rose)



Rhodium salts have a rose color

Used in catalytic converters in cars (which make fumes harmless)

Used in headlight reflectors

Pd 46

Palladium 106.4

Named for asteroid Pallas

Used in dentistry and in jewelry
Used in catalytic converters in cars
Used to purify hydrogen gas
Used to treat tumors

Ag 47

Silver 107.8

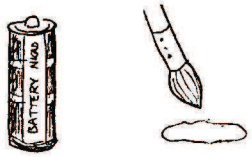
Latin: "argentum" (silver)

Used for coins, jewelry, mirrors, silverware, photographic film, and electronic equipment
Sterling silver contains copper

Cd 48

Cadmium 112.4

Greek: "kadmeia" (earth)

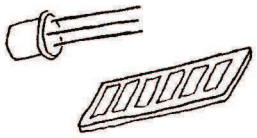


Used in rechargeable batteries
Is a neutron-absorber in nuclear reactors
Yellow and red pigment in paints

In 49

Indium 114.8

Latin: "indicum" (indigo blue)

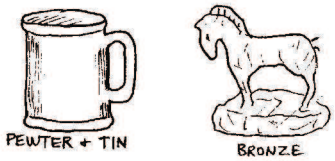


Used in transistors and solar cells
Spectrum has a bright purple line
Often mixed with other metals to make alloys

Sn 50

Tin 118.7

Latin: "stannum" (tin)

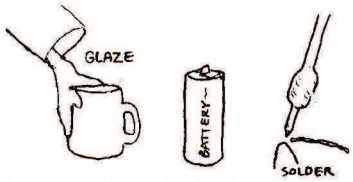


Named after Etruscan god Tinia
Is an ingredient in pewter
Mixed with copper to make bronze
Turns into powder at low temperatures

Sb 51

Antimony 121.7

Greeks called it "antimony"

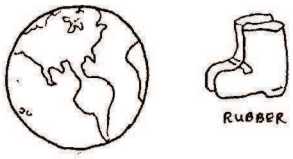


Other peoples called it "stibium"
Used in ceramics, glazes, solder, lead batteries, and matches
Increases hardness in alloys

Te 52

Tellurium 127.6

Latin: "tellus" (earth)

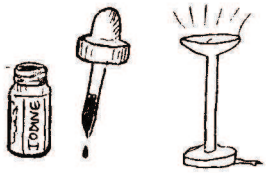


Used in vulcanization of rubber
Used in metal alloys
Is one of the few elements that will bond with gold

I 53

Iodine 126.9

Greek: "iodes" (violet)

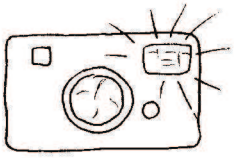


Used as a disinfectant
Used in halogen lamps, ink pigments, and photographic film
Human thyroid glands need iodine.

Xe 54

Xenon 131.3

Greek: "xenos" (strange)

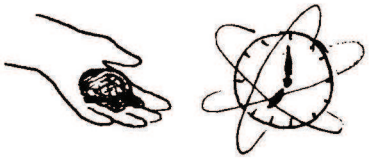


Used in camera flash bulbs, strobe lights, UV lamps, and tanning bed lamps

Cs 55

Cesium 231.9

Latin "caesius" (sky blue)

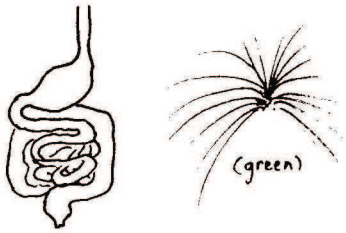


Will melt in your hand.
Used in atomic clocks.
Is a "scavenger" (catches molecules) in vacuum tubes.

Ba 56

Barium 137.3

From the mineral barite

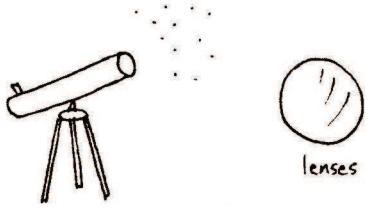


Used for X-rays of digestive system.
Used in fireworks, magnetic recording tape, and spark plugs.

La 57

Lanthanum 138.9

Greek "lanthanein" (lie hidden)

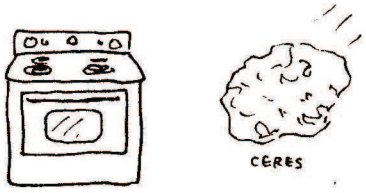


Used in telescope and camera lenes.
Also used for electrodes in high intensity light (ex: search lights)

Ce 58

Cerium 140.1

Named after asteroid Ceres



Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in self-cleaning ovens.
Used in electrodes in lights.

Pr 59

Praseodymium 140.9

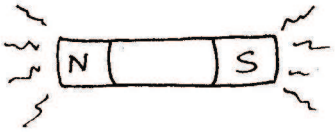
Grk "prasios dydymos" (green twin)

Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used to color green glass.
Used in electrodes in lights.

Nd 60

Neodymium 144.2

Greek "neos dydymos" (new twin)

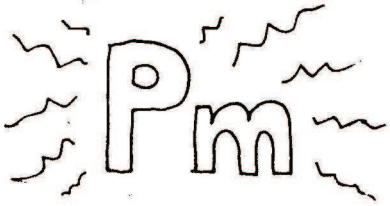


Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in powerful magnets.
Used to color glass and make rubies.

Pm 61

Promethium 144.9

Greek god Prometheus

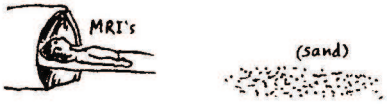


Is a synthetic element, made in nuclear reactors.
Can be a source of X-rays for portable X-ray machines.

Sm 62

Samarium 150.3

Named for mineral samarskite (which was named for Col. Samarski, a Russian army engineer))

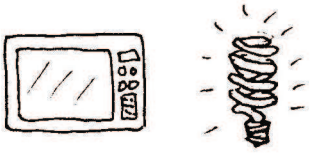


Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in magnets in MRI's, and in infra-red absorbing glass.

Eu 63

Europium 151.9

Named after Europe

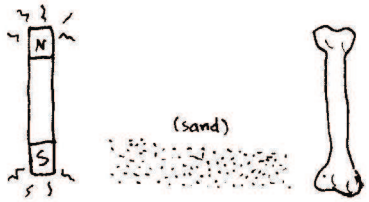


Used in color TV tubes (red).
Used in mercury lamps and energy-saving fluorescent lamps.

Gd 64

Gadolinium 157.2

After chemist Johann Gadolin



Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in magnets and TV tubes.
Used to diagnose osteoporosis.

Tb 65

Terbium 158.9

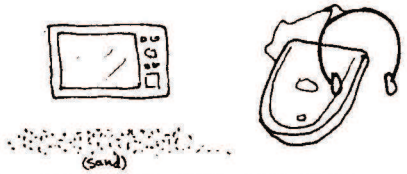
Named after Ytterby, Sweden

Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in TV tubes and X-ray screens.
Used in metal alloys in CD players.

Dy 66

Dysprosium 162.5

Greek "dysprositos" (hard to get)

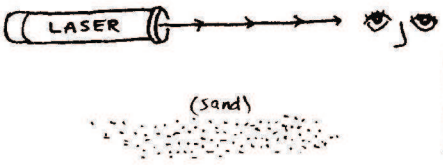


Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in TV tubes, mercury lamps, and magnets in CD players

Ho 67

Holmium 164.9

After Stockholm, Sweden

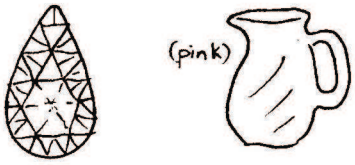


Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in eye-safe medical lasers.
Used to color glass.

Er 68

Erbium 167.26

Named for Ytterby, Sweden



Used in alloys with vanadium, to improve malleability.
Used for pink coloring in glass.
Used to make artificial gemstones.

Tm 69

Thulium 168.9

"Thule" is an ancient name for Scandinavia

Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in lasers and in medical imaging. It is very rare.

Yb 70

Ytterbium 173.0

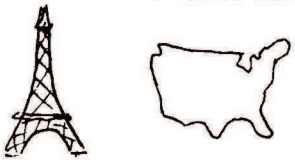
Named for Ytterby, Sweden

Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Used in dentures. Added to stainless steel to improve strength.

Lu 71

Lutetium 174.9

Lutetia: ancient name for Paris



Found in sands of FL, CA, India and Brazil (called "monazite" sand)
Only natural occurring element discovered in America. Used in temperature sensing optics.

Hf 72

Hafnium 178.5

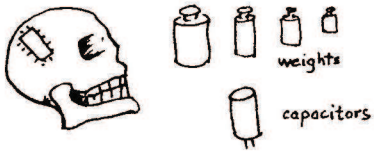
Hafnia is ancient name for Copenhagen, Denmark

Usually found with zirconium.
Used in nuclear submarines and reactors. Used as a gas scavenger (collector) in vacuums.

Ta 73

Tantalum 180.9

Named for Greek god Tantalus

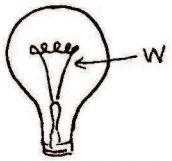


Used in the repair of bones, especially in the skull.
Used to make tools and weights.
Used for capacitors in electronics.

W 74

Tungsten 183.8

Used to be called Wolframite
Swedish "tung stem" (heavy stone)

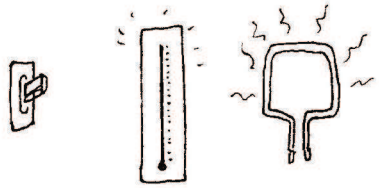


Used for filaments in light bulbs.
Used for high-speed cutting tools.
Has the highest melting point of all the metals.

Re 75

Rhenium 183.8

Latin "Rhenus" (Rhine River)

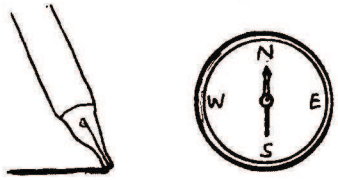


Used in alloys, especially for electrical switches and contacts.
Used for high temp. thermometers
Used for oven filaments.

Os 76

Osmium 190.2

Greek "osme" (smell)

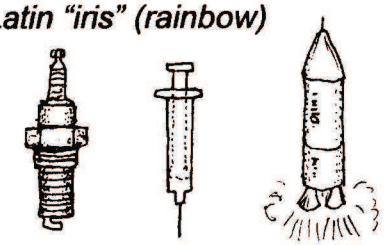


Used in pen points and compass needles.
Mixed with platinum and iridium for alloys.

Ir 77

Iridium 192.2

Latin "iris" (rainbow)



Iridium's salts are highly colored.
Used in helicopter spark plugs, hypodermic needles, and rocket engines. It is mixed with platinum.

Pt 78

Platinum 195.1

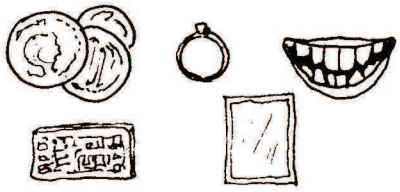
Spanish "platina" (silver)

Used in jewelry and dentistry.
Used in petroleum and electronic industries. Most platinum comes from South Africa and Russia.

Au 79

Gold 196.9

Latin "aurum" (shining dawn)



Used for coins, jewelry, dentistry, electrical parts and wires.
Used as reflective coating on the outside of large glass windows.

Hg 80

Mercury 200.6

Latin "hydragyrum" (liquid silver)
Roman god Mercury.

Used in thermometers, barometers, and street lights.
Comes from the ore cinnabar, found in Spain and Italy.

Tl 81

Thalium 204.4

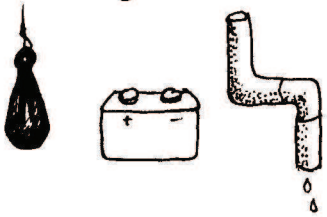
Greek "thallos" (green twig)

Looks like lead and is poisonous.
Was once used in insecticides.
Used in diagnosis of heart disease.
Used in infrared detectors.

Pb 82

Lead 207.2

Latin "plumbum" (lead)
Ancient Anglo-Saxon "lead"



Used in fishing weights, batteries, protection from radiation.
Was used in Rome for water pipes.

Bi 83

Bismuth 208.9

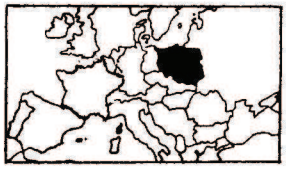
German "weisse masse" (white mass)

Used in stomach medicines such as Pepto-bismol ®
Used in fire sprinkler systems, rubber, fuses, and cosmetics.

Po 84

Polonium 209

Named after Poland



Discovered by Marie Curie, who was born in Poland.
Is very radioactive, and is used as a source of radiation.

At 85

Astatine 210

Greek "astatos" (unstable)

Very little known about it.
Total amount on Earth is only about one ounce!
Is radioactive.

Rn 86

Radon 222

Radon is the heaviest known gas.
Is radioactive and is believed to cause lung cancer.
Used in earthquake prediction.

Fr 87

Francium 223

Named after France

Discovered in France.
Is very radioactive. Comes from the decay of uranium and thorium.
Too unstable for any use.

Ra 88

Radium 223

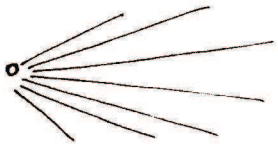
Latin "radius" (ray)

Discovered with the spectrometer, as an impurity in uranium ores.
Is radioactive. (Used to be used for glow-in-the-dark watches!)
Now it is used to make radon for use in medical procedures.

Ac 89

Actinium 227

Greek "aktinus" (ray or beam)



Is radioactive.
Comes from the decay of uranium and thorium.
No commercial use.

Th 90

Thorium 232

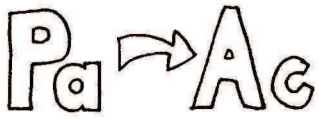
Ancient Scandinavian god Thor, (god of thunder and lightning)

More common than uranium.
Used in the "mantles" of camping lanterns (the thing that glows).
Used as source of electrons in electronic devices. Decays again and again until it ends up as lead.

Pa 91

Protactinium 231.0

Greek "protos" (first) and element actinium

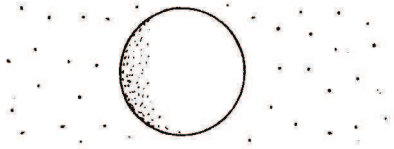


Named this because it always decays into actinium.
Not much known about it.
No commercial use.

U 92

Uranium 238.0

Named after planet Uranus

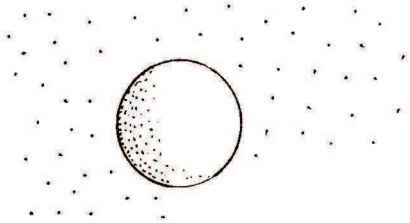


Discovered just after Uranus was.
Used as fuel in nuclear reactors.
Depleted uranium is used to color glass and in metals used to make military equipment.

Np 93

Neptunium 237.0

Named after planet Neptune



Radioactive.
Produced as a by-product of nuclear fission.

Pu 94

Plutonium 244.0

Named after planet Pluto

Made from uranium.
Produced in huge quantities in "breeder" reactors.
Used in nuclear weapons.
Powers lunar modules.

Am 95

Americium 243.0

Named after America

Radioactive.
Used in crystal research.
Used in smoke detectors.
Used as a source of neutrons.

Cm 96

Curium 247.0

Named after Marie Curie

Radioactive.
Used in heart pacemakers.
Used in ocean buoys.
Supplies energy source on space missions.

Bk 97

Berkelium 247.0

Named after Berkeley, CA

Radioactive.
No commercial or scientific applications.

Cf 98

Californium 251

Named after California

Radioactive.
Portable neutron source.

Es 99

Einsteinium 254

Named after Albert Einstein

Found while investigating the debris of the first hydrogen bomb explosion in the Pacific Ocean.
Extremely radioactive

Fm 100

Fermium 257

Named after Enrico Fermi

Found while investigating the debris of the first hydrogen bomb explosion in the Pacific Ocean.
Extremely radioactive.

Md 101

Mendelevium 258

Named after Dmitri Mendeleyev

Made in nuclear reactors.
Extremely unstable.
No commercial or scientific use.

No 102

Nobelium 259

Named after Alfred Nobel

Made in nuclear reactors.
Extremely unstable.
No commercial or scientific use.

Lr 103

Lawrencium 260

Named after Ernest Lawrence

Lawrence was the inventor of the cyclotron machine that was used to discover elements heavier than uranium.
Radioactive and highly unstable.
Only exists for a few minutes.

Rf 104

Rutherfordium 261

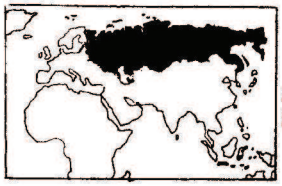
Named after Ernest Rutherford

Made in nuclear reactors.
Extremely unstable; radioactive.
No commercial or scientific use.
Only exists for a few minutes.

Db 105

Dubnium 262

Named after Dubna, Russia



Made in a reactor in Russia.
Radioactive and unstable.
Only exists for a few minutes.

Sg 106

Seaborgium 263

Named after Glenn Seaborg

Made in nuclear reactors.
Extremely unstable.
No commercial or scientific use.
Only exists for a few seconds!!

Bh 107

Bohrium 262

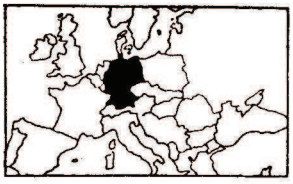
Named after Niels Bohr

Made in nuclear reactors.
Extremely unstable.
Exists for such a short time that no one can study it!

Hs 108

Hassium 265

Named after Hesse, Germany



Made in nuclear reactors.
Extremely unstable.
No commercial or scientific use.
Only exists for a fraction of a second!!