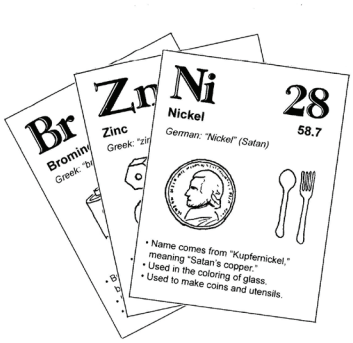
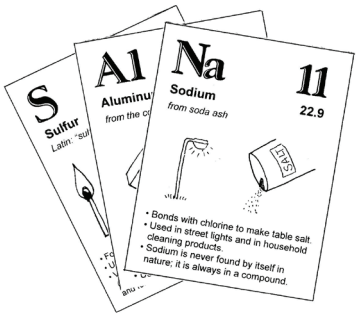


QUICK SIX



A FAST-PACED CARD GAME ABOUT THE ELEMENTS

You will need: Scissors, photocopies of the pattern pages on white card stock, colored pencils if you would like the students to color the cards, and a copy of the Periodic Table for each student

Set up

Cut apart the cards. If you would like the students to add color to the cards, provide colored pencils and some extra coloring time.

How to play

The object of the game is to be the first player to collect six cards.

Decide which player will be the "caller." This player must read from the list below 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 go 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 player has six cards in his "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, 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.

Note: Some of these clues require the students to look at the atomic weight, or "mass," of the element. (Weight and mass are not really the same thing, but in this case the words can be used interchangeably, so we won't go into the difference between them. Kids seem to prefer "weight" to "mass.") The atomic mass is listed in smaller print right under the atomic number. It is basically the number of protons and neutrons added together. Electrons are so small they add almost nothing to the total mass. The students may notice that some of the atomic masses are decimal numbers, instead of whole numbers, and they may wonder if this means that there can be fractional pieces of protons and neutrons. The reason for these decimal numbers is that scientists measured many atoms, then took a mathematical average. Since a small percentage of atoms have one or two more (or less) neutrons, the average comes out to a decimal number. For example, if you weigh ten atoms of neon and get these results: 20, 20, 20, 20, 20, 20, 20, 20, 21, 21, then take the average, you will get 20.2. This is the atomic mass listed for neon. Most neon atoms have 10 protons and 10 neutrons, but once in a while you will meet a neon atom with 10 protons and 11 neutrons.

QUICK SIX CLUES

The clues are in groups of ten just to make them easier to read (so you don't lose your place so easily).

Number has a 3 in it
Name 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
Starts with the letter C
Number has a 5 in it
Name has something to do with color
Used to make tools of some kind

Is named after a city (not a country)
Name has three syllables
Is used to make jewelry
Named after a country
Used for something that burns
Named after something in the solar system
Number has a 7 in it
Is named after a country (not a city)
Used in fireworks
Has something to do with bones

Name starts with a vowel
Gemstones are made from it
Used in steel production
Used to repair the human body
Used in light bulbs
Is found as a gas in the air around us
Has something to do with eyes
Conducts electricity
Last three letters of the name are I-U-M
Name is from a Latin word

Is used in batteries or fuel
Has something to do with glass
First letter of name does not match first letter of the symbol
Is found in some kind of gemstone
Name begins with the letter S
Name comes from a chemical compound
Name starts with the "K" sound (C or K)
Is used in magnets of any kind
Used in something that makes light
Used to make coins

Contains one of these letters: X, Y, or Z
Name has four syllables
Number has a 1 in it
Does not bond with any other element
Used in glass

Quick Six clues page 2

Name comes from a compound
Has an atomic number less than that of tin
Has the word “light” or “lights” in the description
Name ends with –ine
Has an atomic number between 50 and 60

Atomic number has a 3 in it
Name 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
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
Name has four syllables

Quick Six clues page 3

Atomic number has a 0 in it
Used in steel production
Used to repair the human body in some way
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
The atomic mass listed on the card is exactly double the atomic number
Name comes from a Greek word or words
Used in TVs

Is in the third row of the periodic table
Name starts with the letter *u*
Used for coins
Unstable; only exists for a short time
Used in catalytic converters
Has a *y* in its name
Is in the third column of the periodic table
Used in lights
Made in nuclear reactors
Name comes from a German word or words

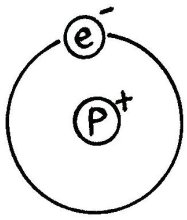
All the digits of the atomic number are the same
Used in batteries
Name has something to do with a color
The digits of its atomic number add up to 10
Used in magnets
Has an *x* in its name
Has an atomic number greater than 90
Name starts with the letter *m*
Used as a scavenger in vacuum tubes
Has more than 4 vowels in its name (*y* is a vowel)

Is in the first column of the periodic table
Name ends in “–on”
Name starts with the letter *s*
Has an atomic mass less than 10
Name has less than 5 letters
The sum of the atomic number and atomic mass is between 100 and 200

H 1

Hydrogen **1.0**

Greek: "hydro–gen" (water-maker)

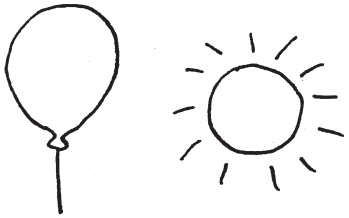


- Has no neutrons.
- Most abundant element in the Universe.
- Used in rocket fuel and fuel cells.

He 2

Helium **4.0**

Greek: "helios" (sun)

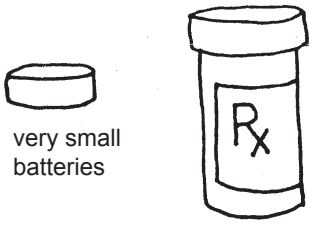


- Used in balloons, blimps and scubing diving tanks.
- Discovered in the sun in 1895 using a spectrometer.

Li 3

Lithium **6.9**

Greek: "lithos" (stone)

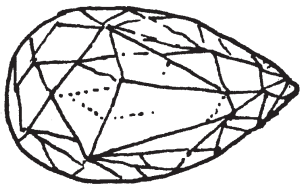


- Used in batteries, lubricants, medicines, and nuclear bombs.
- Is never found by itself in nature (it's always in a compound).

Be 4

Beryllium **9.0**

from the mineral "beryl"



- Found in emeralds.
- Is 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.
- Used to make boric acid, which is used as an antiseptic eye wash.
- Used in nuclear power plants.

C 6

Carbon **12.0**

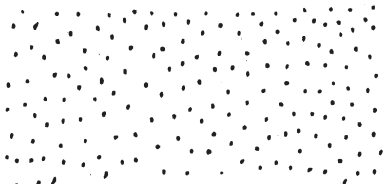
Latin: "carbo" (charcoal)

- Diamonds, graphite and coal are all made of carbon.
- Carbon makes long chains (polymers) that are the basis of fossil fuels and plastics.
- Carbon is necessary for organic molecules found in living organisms.

N 7

Nitrogen **14.0**

Greek: "nitron" (the mineral saltpetre)



- Most of the air we breathe is nitrogen.
- Used in air bags in cars.
- Doctors use liquid nitrogen to treat skin conditions.
- Proteins and DNA contain nitrogen.

O 8

Oxygen **15.9**

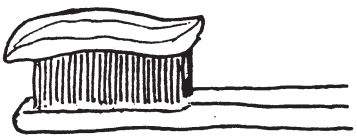
Greek: "oxy-gen" (acid-maker)

- Found in air, water and sand.
- Necessary for respiration and combustion.
- Ozone is made of pure oxygen.

F 9

Fluorine **18.9**

Latin: "fluere" (to flow)

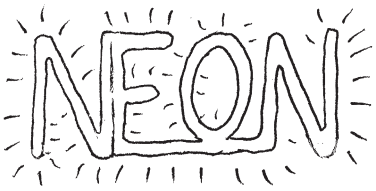


- Found in the mineral fluorite.
- Is put into toothpaste to fight cavities.
- Used as a coolant.
- Used in nuclear power plants.

Ne 10

Néon **20.1**

Greek: “neo” (new)

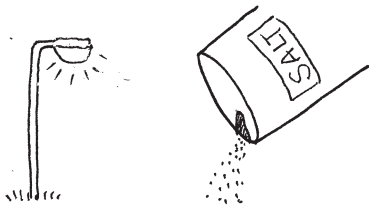


- Used in neon lights and lasers.
- Neon never bonds to any other elements.

Na 11

Sodium **22.9**

from soda ash

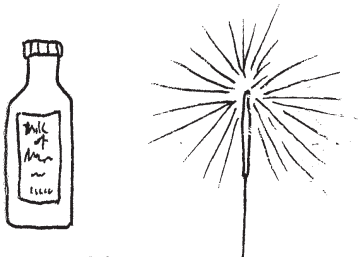


- Bonds with chlorine to make table salt.
- Used in street lights and in household cleaning products.
- Sodium is never found by itself in nature; it is always in a compound.

Mg 12

Magnesium **24.3**

from Magnesia, in Greece

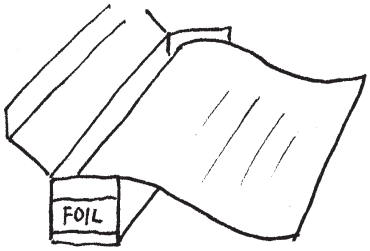


- Used in sparklers.
- Found in Epsom salts and “milk of Magnesia”
- Plants and animals need magnesium.

Al 13

Aluminum **26.9**

from the compound “alumina”

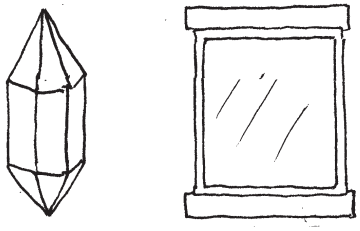


- Used in airplanes because it is so light and strong.
- Used for foil, tubes and cables.
- Used in fireworks.

Si 14

Silicon **28.0**

Latin: “silex” (hard stone, boulder)

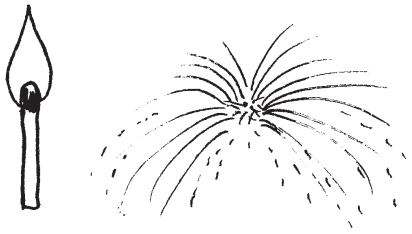


- Found in sand, clay, lava, glass and the mineral quartz.
- Used to make computer chips.

P 15

Phosphorus **30.9**

Greek: “phosphoros” (bringer of light)



- Used in matches, fireworks, fertilizers and detergents.
- Discovered by an alchemist in 1669 as he was boiling down urine!

S 16

Sulfur **32.0**

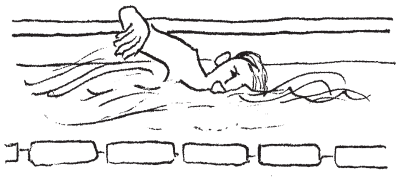
Latin: “sulfur” (stone that burns)

- Found in matches and fireworks.
- Used to vulcanize rubber.
- Volcanoes produce sulfur dioxide gas (a gas that’s also produced by some factories and forms a large part of air pollution).

Cl 17

Chlorine **35.4**

Greek: “kloros” (light green)

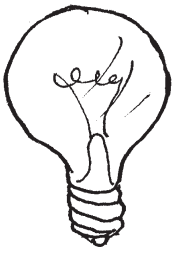


- Bonds with sodium to make table salt.
- Used to disinfect swimming pools.
- Is an ingredient in PVC plastics.
- Combines with hyrdogen to make HCl, an acid that your stomach produces to help with digestion.

Ar 18

Argon **39.9**

Greek: “argos” (lazy)

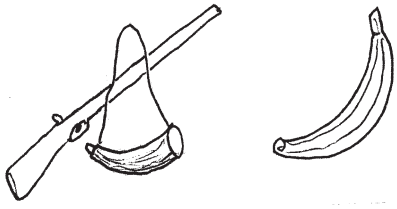


- Used in lightbulbs and lasers.
- Does not bond to, or react with, any other element.

K 19

Potassium **39.0**

from the word "potash"

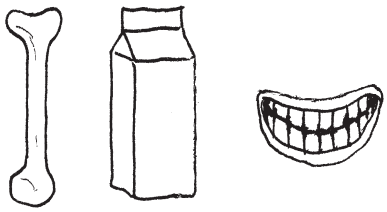


- Used in fertilizers.
- Is an ingredient in gun powder.
- Bananas contain a lot of potassium.
- Can form salts, just like sodium can.

Ca 20

Calcium **40.0**

Latin: "calx" (chalk)

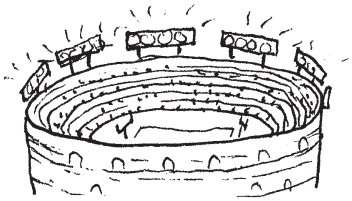


- Found in chalk, limestone, plaster, concrete, bones, and teeth.
- Milk contains a lot of calcium.
- Calcium in water makes it "hard."

Sc 21

Scandium **44.9**

named after Scandinavia

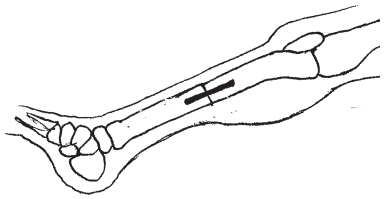


- Used in stadium lighting.
- Used in large television screens.
- Radioactive scandium is used as a "tracer" in petroleum refineries.

Ti 22

Titanium **47.9**

named after the Greek Titan gods

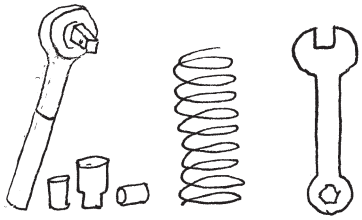


- Used to repair bones.
- Because it is lightweight it is used in airplane motors.
- Is an ingredient in paint pigments.

V 23

Vanadium **50.9**

after the Scandinavian goddess Vanadis

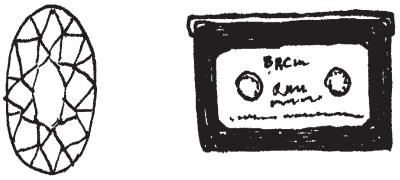


- Used in making steel.
- Is an ingredient in metals that are used to make tools, springs and engines.

Cr 24

Chromium **51.9**

Greek: "chroma" (color)

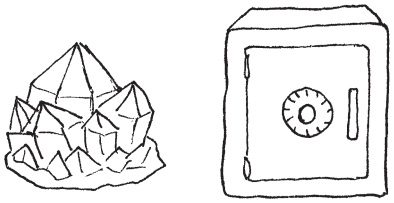


- Gives rubies their red color.
- Used to make red, green and yellow paint.
- Used as a shiny coating for metals.
- Used to make video tapes.

Mn 25

Manganese **54.9**

Latin: "magnes" (magnetic)

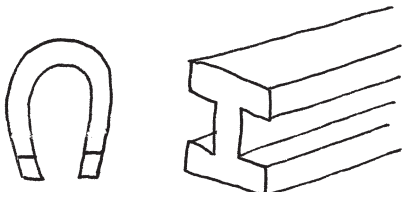


- Added to steel that needs to be very strong (for example: rifle barrels and bank vaults).
- Is necessary for the functioning of vitamin B1 in our bodies.

Fe 26

Iron **55.8**

from Old English "iren"

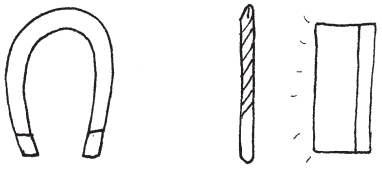


- Discovered in ancient times.
- Used in steel and in magnets.
- Found in red blood cells and in rust.
- Meteorites often contain iron.
- Red rocks usually contain iron.

Co 27

Cobalt **58.9**

German "kobald" (evil gnomes)



- Miners used to say "kobald" lurked in the mines (and the name stuck).
- Used in "alnico" magnets.
- Used in making drill bits and razors.
- Can be used to color glass deep blue.

Ni 28

Nickel **58.7**

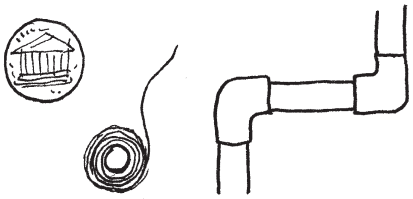
German: "Nickel" (Satan)

- Name comes from "Kupfernickel," meaning "Satan's copper."
- Used in the coloring of glass.
- Used to make coins and utensils.

Cu 29

Copper **63.5**

Latin: "Cuprum" (from Cyprus)

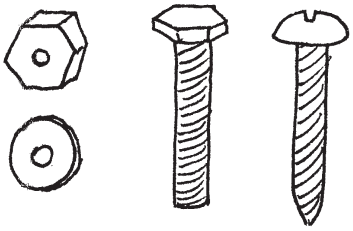


- Used for coins, wires and pipes.
- The Statue of Liberty is made of copper.
- Copper mixed with zinc makes brass.
- Copper mixed with tin makes bronze.

Zn 30

Zinc **65.4**

Greek: "zink"

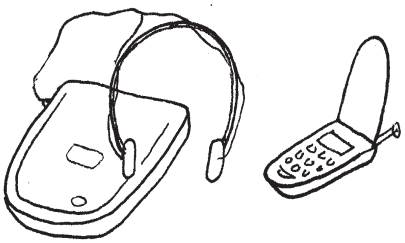


- Used for galvanizing (protecting) metals such as iron and steel.
- Zinc sulfide glows in the dark.
- Zinc oxide is used in photocopiers.

Ga 31

Gallium **69.7**

Latin: "Gallia" (France)



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

Ge 32

Germanium **72.6**

Latin: "Germania" (Germany)

semi-conductor

lens

- Is a semi-conductor and therefore is used in transitors.
- Used in lenses and fiberoptics.

As 33

Arsenic **74.9**

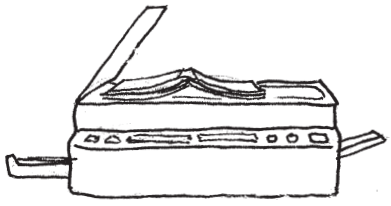
Latin: "arsenicum" (a pigment)

- Famous for its use as a poison.
- Is an ingredient in weed killers and insecticides.
- Used in lasers and LED's.

Se 34

Selenium **78.9**

Greek: "selene" (moon)

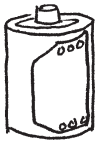


- Used in photocopiers because it conducts electricity in the presence of light.
- Used in robotics and in light meters.
- Selenium is beneficial to our bodies and acts as an anti-oxidant, protecting use from cellular damage.

Br 35

Bromine **79.9**

Greek: "bromos" (stench)

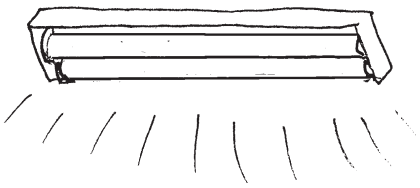


- Bromine is a reddish liquid with a very bad smell.
- Found in sea water and salt mines.
- Used in photographic film.

Kr 36

Krypton **83.8**

Greek: "kryptos" (hidden)

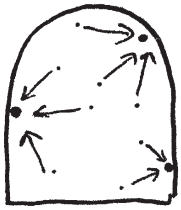


- Used in fluorescent flight, especially photographic bulbs.
- Used in UV lasers and in atomic clocks.

Rb 37

Rubidium **85.5**

Latin: "rubidus" (deep red)



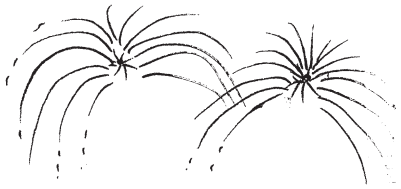
Rubidium captures atoms of gases that should not be in a vacuum jar or tube..

- Is a by-product of the refinement of lithium and cesium.
- Used as a gas "scavenger" (collector) in vacuum tubes.

Sr 38

Strontium **87.6**

after the Scottish village of Strontia

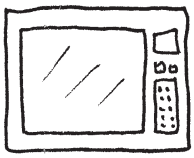


- Used in fireworks (bright red).
- Used in batteries in ocean buoys.
- Used to produce beta radiation.
- Used to research bone structure.

Y 39

Yttrium **88.9**

after the Swedish town of Ytterby



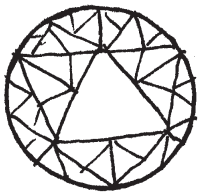
a moon rock

- Used in superconductors and lasers.
- Rocks from the moon contain yttrium.
- Used to make the bright red color in television screens.

Zr 40

Zirconium **91.2**

Arabic: "zargun" (gold color)

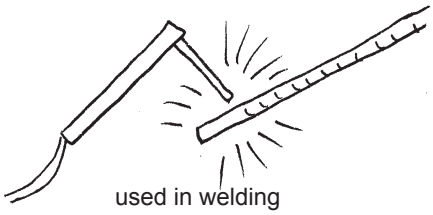


- Made into gemstones.
- Used in catalytic converters in cars.
- Used for heat-resistant parts in nuclear power plants and in space shuttles.

Nb 41

Niobium **92.9**

named after the Greek goddess Niobe



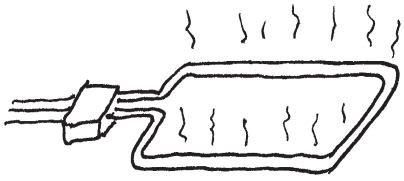
used in welding

- Used in welding rods, cutting tools, and superconducting magnets.
- Is added to steel to make it heat-resistant.

Mo 42

Molybdenum **95.9**

Greek: "molybdos" (lead)



- Used for filaments in heaters.
- is an ingredient in steel that is used to make engines for cars and planes.
- Large deposits of molybdenum are found in Colorado.

Tc 43

Technitium **99.0**

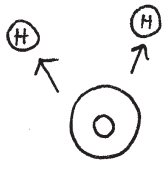
Greek: "teknetos" (artificial)

- Is radioactive.
- Not found in nature. Must be made in a nucluear laboratory.
- Is combined with other elements and used in medical procedures.

Ru 44

Ruthenium **101.1**

Latin: "Ruthenia" (Russia)

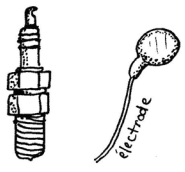


- Used to split water molecules.
- Used in the jewelry making industry.
- Often mixed with titanium and platinum to increase their hardness.

Rh 45

Rhodium **102.9**

Greek: "rhodon" (rose)



- Rhodium salts have a rose color.
- Used in catalytic converters in cars.
- Used in headlight reflectors.
- Used in jewelry to prevent tarnishing of sterling silver.
- Combined with **Pt** and **Pd** to make spark plugs, electrodes, and other electronic parts.

Pd 46

Palladium **106.4**

named after the asteroid Pallas

- Used in dentistry and in jewelry.
- Used in catalytic converters in cars.
- Used to purify hydrogen gas.
- Used for treatment of tumors.

Ag 47

Silver **107.8**

Anglo-Saxon: "soilful" (silver)
Symbol from Latin "argentum"

- Used to make coins, jewelry, mirrors, silverware, photographic film and electronic components.
- Sterling silver contains copper.

Cd 48

Cadmium **112.4**

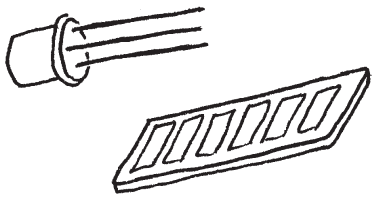
Greek: "kadmeia" (earth)

- Used in rechargeable batteries.
- Is a neutron-absorber in nuclear reactors.
- Used to make yellow and red pigments in paints.

In 49

Indium **114.8**

Latin: "indicum" (indigo blue)



- Used in transistors and solar cells.
- Often mixed with other metals to make alloys.
- Its light wave pattern in a spectrometer shows bright purple lines.

Sn 50

Tin **118.7**

Latin: "stannum" (tin)

pewter

bronze

- Is an ingredient of pewter.
- Is mixed with copper to make bronze.
- Turns into powder at low temperatures.

Sb 51

Antimony **121.7**

Greek: "anti-monos" (not alone)
Symbol comes from "stibnium"

- Is also known by the name Stibnium.
- Used in ceramics, glazes, solder, lead batteries and matches.
- Increases hardness in alloys.

Te 52

Tellurium **127.6**

Latin: "tellus" (earth)

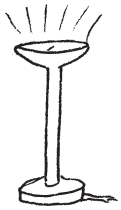
rubber

- Used to "vulcanize" rubber (although sulfur is the key ingredient in vulcanization)
- Is one of the few elements that will bond with gold.
- Used to color glass.
- Used in ceramics.

I 53

Iodine **126.9**

Greek: "iodes" (violet)

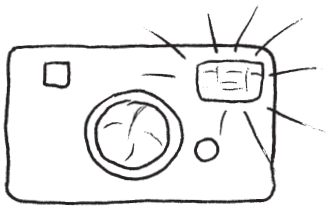


- Used as a disinfectant.
- Used in halogen lamps, ink pigments and photographic film.
- Our thyroid glands need iodine.

Xe 54

Xenon **131.3**

Greek: "xenos" (strange)

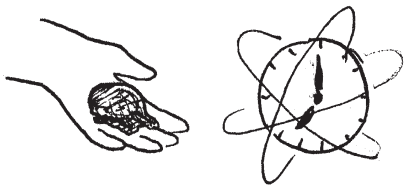


- Used in camera flash bulbs, strobe lights, UV lamps and tanning bed lamps.

Cs 55

Cesium **132.9**

Latin: "caesius" (sky blue)

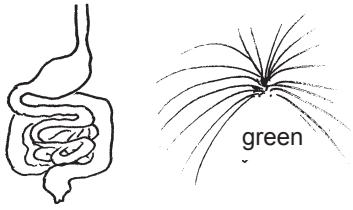


- Will melt in your hand.
- Used in atomic clocks.
- Used as a "scavenger" (collector) of unwanted atoms of gas in vacuum tubes.

Ba 56

Barium **137.3**

Greek: "barys" (heavy)

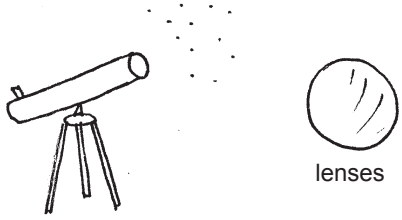


- Used for X-rays of digestive systems.
- Used in fireworks (green color), magnetic recording tapes, and spark plugs.

La 57

Lanthanum **138.9**

Greek: "lanthanein" (to lie hidden)

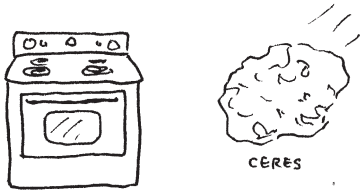


- Used in telescope and camera lenses.
- Used for electrodes in high intensity lights (example: search lights).

Ce 58

Cerium **140.1**

named after the asteroid Ceres

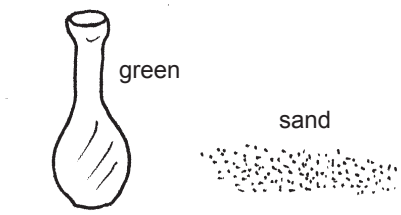


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in self-cleaning ovens.
- Used in electrodes in lights.

Pr 59

Praseodymium **140.9**

Greek: "prasios-didymos" (green twin)

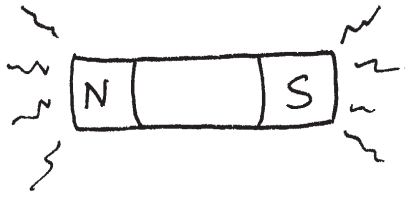


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used to color glass green.
- Used in electrodes in lights.

Nd 60

Neodymium **144.2**

Greek: "neos-didymos" (new twin)

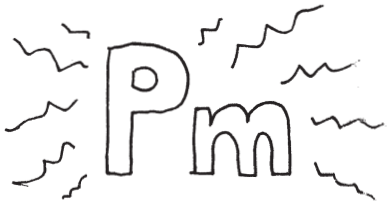


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used to make very strong magnets.
- Used to color glass and to make rubies.

Pm 61

Promethium **147.0**

named after Greek god Prometheus

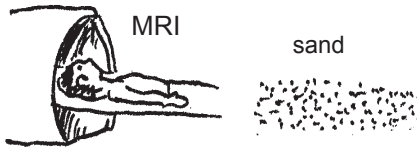


- Is a synthetic element made in nuclear reactors.
- Can be a source of X-rays in portable X-ray machines.

Sm 62

Samarium **150.3**

named after the mineral "samarskite" which was named for Col. Samarski, a Russian army engineer

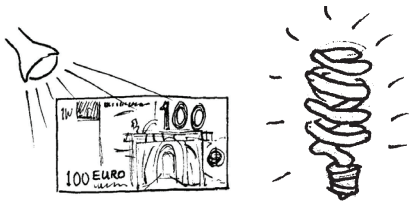


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in magnets for MRI machines, and in infra-red absorbing glass.

Eu 63

Europium **151.9**

named after Europe

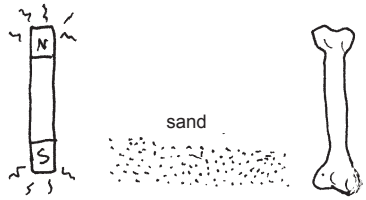


- Used to make red color in televisions.
- Used in mercury lamps and energy-saving fluorescent bulbs.
- Used to identify counterfeit Euros.
- Used to study formation of igneous rocks.

Gd 64

Gadolinium **157.2**

named for chemist Johann Gadolin

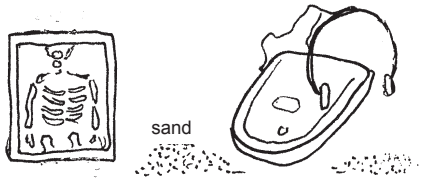


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in magnets and TV tubes.
- Used to diagnose osteoporosis.

Tb 65

Terbium **158.9**

named after Swedish village of Ytterby

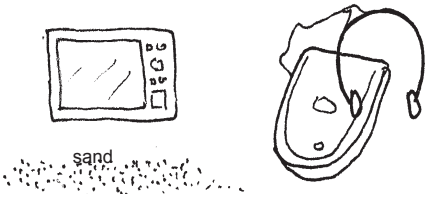


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in TV tubes and X-ray screens.
- Used in metal alloys for CD players.

Dy 66

Dysprosium **162.5**

Greek: "dysprositos" (difficult to obtain)

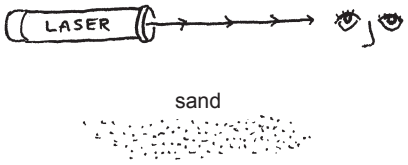


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand")..
- Used in TV tubes, mercury lamps, and magnets inside CD players.

Ho 67

Holmium **164.9**

named for Stockholm, Sweden

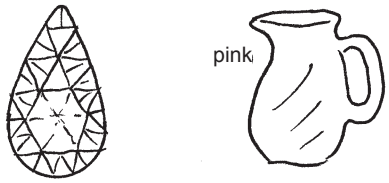


- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in eye-safe medical lasers.
- Used to color glass.

Er 68

Erbium **167.3**

named after Sweidish village of Ytterby

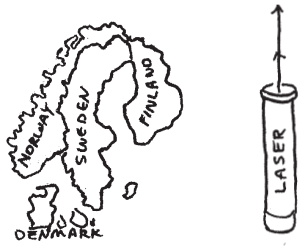


- Used in alloys with vanadium, to make the texture less brittle (easier to shape).
- Used for pink coloring in glass.
- Used to make artificial gemstones.
- Superconducts at low temperatures.

Tm 69

Thulium **168.9**

Thule is the ancient name for Scandinavia



- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in lasers and in medical imaging.
- Is very rare.

Yb 70

Ytterbium **173.0**

named after Swedish village of Ytterby

- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Used in dentures (artificial teeth).
- Is added to stainless steel to improve strength.

Lu 71

Lutetium **174.9**

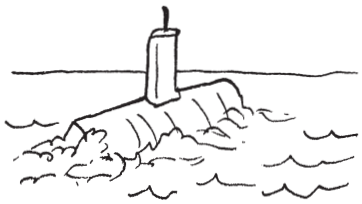
Lutetia is the ancient name for Paris

- Found in sand along the coasts of California, Florida, India and Brazil ("monazite sand").
- Is the only naturally-occurring element discovered in America.
- Used in temperature-sensing optics.

Hf 72

Hafnium **178.5**

Hafnia is the ancient name for Copenhagen

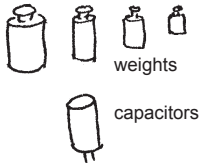


- Usually found with zirconium.
- Used in nuclear submarines and nuclear reactors.
- Used as a gas "scavenger" (collector) in vacuum tubes (to get rid of unwanted atoms of gas).

Ta 73

Tantalum **180.9**

named after the Greek god Tantalus

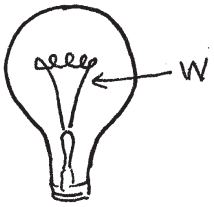


- Used to repair bones, especially in the skull.
- Used to make tools and weights.
- Used for capacitors in electronics.

W 74

Tungsten **183.8**

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

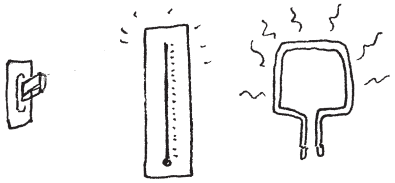


- Used for filaments in light bulbs.
- Used for high-speed cutting tools.
- Has the highest melting point of all the metals.

Re 75

Rhenium **186.2**

Latin: "Rhenus" (Rhine River)

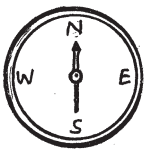


- Used in alloys, especially for electrical switches and contacts.
- Used for high-temp thermometers.
- Used for oven filaments.

Os 76

Osmium **190.2**

Greek: "osme" (smell)

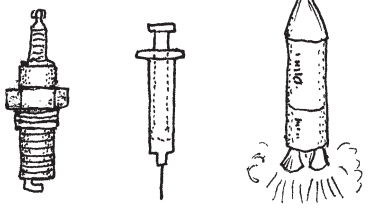


- Used in pen points and compass needles.
- Mixed with platinum and iridium to make alloys.
- Is the most dense element, twice as dense as lead.

Ir 77

Iridium **192.2**

Latin: "iris" (rainbow)



- Iridium salts are highly colored.
- Used in helicopter spark plugs, hypodermic needles and rocket engines.
- Is often mixed with platinum.

Pt 78

Platinum **195.1**

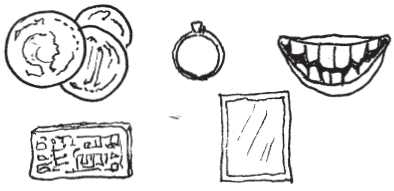
Spanish: "platina" (silver)

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

Au 79

Gold **196.9**

Old English: "gold"
"Au" comes from Latin: "aurum"

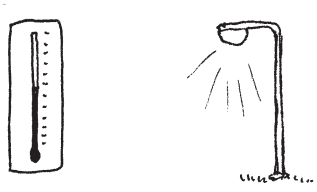


- Used for coins, jewelry, dentistry, and electrical parts that need to conduct electricity.
- Used as a reflective coating on the outside of large glass windows.

Hg 80

Mercury **200.6**

named after the Roman god Mercury



- The symbol **Hg** comes from the Latin "hydragyrum" meaning "liquid silver."
- Used in thermometers, barometers, and street lights.
- Found primarily in the mineral ore "cinnabar," mined in Spain and Italy.

Tl 81

Thallium **204.4**

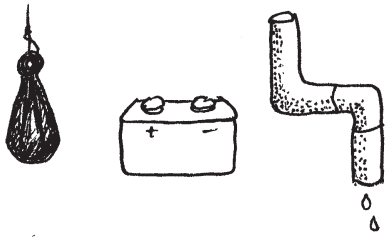
Greek: "thallos" (green twig)

- Looks like lead and is poisonous.
- Was once used in insecticides.
- Used to diagnose heart disease.
- Used in infrared detectors.

Pb 82

Lead **207.2**

Ancient Anglo-Saxon: "lead"
"Pb" comes from Latin: "Plumbum"

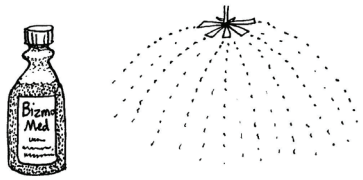


- Used for fishing weights, in batteries, and for protection against X-rays.
- Romans used lead for their water pipes.

Bi 83

Bismuth **208.9**

German" "weisse masse" (white mass)

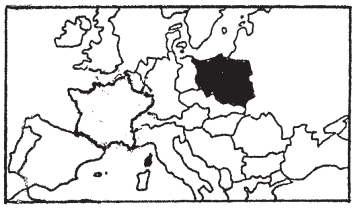


- Used in stomach medicines such as Pepto-bismol®
- Used in indoor sprinkler systems (fire safety for commercial buidings).
- Used in the manufacturing of rubber, fuses, and cosmetics

Po 84

Polonium **210**

named after Poland

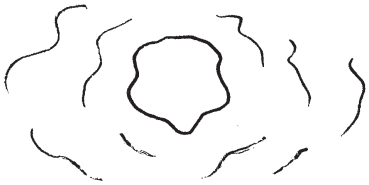


- Discovered by Marie Curie, who was born in Poland.
- Is very radioactive. Can be used as a source of radiation.

At 85

Astatine **210**

Greek: "astatos" (instable)



- Very little is known about this element.
- The total amount of astatine that exists is estimated to be only about an ounce!
- Is radioactive.

Rn 86

Radon **222**

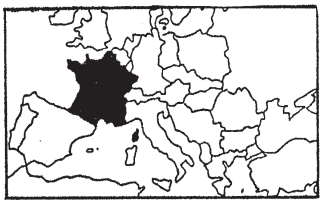
named after the element radium

- Is the heaviest gaseous element.
- It is radioactive and probably causes lung cancer.
- Used in earthquake prediction.

Fr 87

Francium **223**

named after France

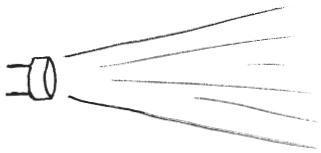


- Discovered in France.
- Is very active.
- Comes from the decay of uranium and thorium.
- Is too unstable to be used for anything.

Ra 88

Radium **226.0**

Latin: "radius" (ray)

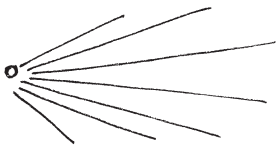


- Discovered with the spectrometer, as an impurity in uranium ores.
- Was once used to make glow-in-the-dark watches.
- Can be used to make radon, for use in medical procedures.

Ac 89

Actinium **227**

Greek: "actinos" (ray or beam)



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

Th 90

Thorium **232**

after the ancient Scandinavian god Thor, god of lightning and thunder

- More common than uranium.
- Used as a source of electrons in some electronic devices.
- Used in the "mantles" of camping lanterns (that little bag-like thing that glows)

Pa 91

Protactinium **231**

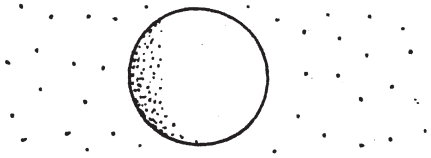
Greek: “protos” (first), plus “actinium”

- Was given this name because it always decays into actinium.
- Not much is known about it.
- Has no commercial use.

U 92

Uranium **238**

named after the planet Uranus

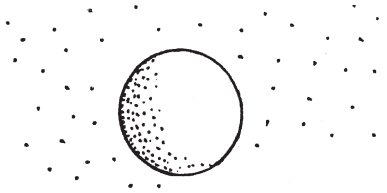


- Is radioactive.
- Was discovered just after Uranus was.
- Used as fuel in nuclear reactors.
- Depleted uranium (which is much less radioactive) is used to color glass and to make metals for military vehicles.

Np 93

Neptunium **237**

named after the planet Neptune

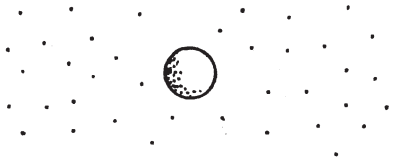


- Is radioactive.
- Is produced as a by-product of nuclear fission.
- Very small quantities of naturally-occurring neptunium have recently been discovered in uranium ores.

Pu 94

Plutonium **242**

named after Pluto



- Is made from uranium inside “breeder” nuclear reactors.
- Used in nuclear weapons.
- Was used to power the lunar modules.
- The element barium was almost named plutonium!

Am 95

Americium **243**

named after America

- Is radioactive.
- Used in smoke detectors.
- Used in crystal research.
- Used as a source of neutrons.

Cm 96

Curium **247**

named after Marie Curie

- Is radioactive.
- Used in pacemakers in heart, and also in ocean buoys.
- Has been used as an energy source on space missions.

Bk 97

Berkelium **247**

named after Berkeley, California

- Is radioactive; was made in Berkeley, Ca.
- Has no commerical use.
- BkCl3 (berkeliium trichloride) was the first compound to be made with this element. The quantity produced was very small-- only.000000003 of a gram!

Cf 98

Californium **251**

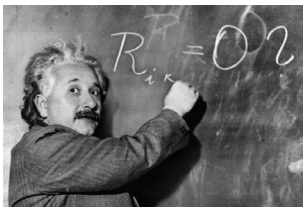
named after California

- Is radioactive.
- Can be used as a portable source of neutrons.
- Named after California because that’s where it was made/discovered.

Es 99

Einsteinium **252**

named after Albert Einstein

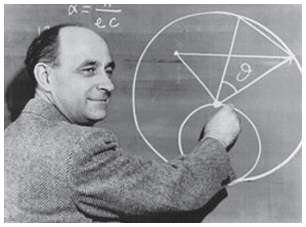


- Discovered during the investigation of debris from the first atomic bomb.
- Extremely radioactive and unstable.
- Einstein is famous for his equation that shows the relationship of matter to energy ($e=mc^2$).

Fm 100

Fermium **257**

named after Enrico Fermi



- Discovered during investigation of the debris from the first atomic bomb.
- Extremely radioactive and unstable.
- No commerical use.
- Fermi was a physicist who studied atomic structure and radioactivity.

Md 101

Mendelevium **256**

named after Dmitri Mendeleyev

- Radioactive and very unstable.
- Made in nuclear reactors.
- No commerical use.
- Mendeleyev invented the Periodic Table.

No 102

Nobelium **259**

named after Alfred Nobel

- Very radioactive and very unstable.
- Made in nuclear reactors.
- No commerical use.
- Alfred Nobel established the Nobel Prizes.

Lr 103

Lawrencium **262**

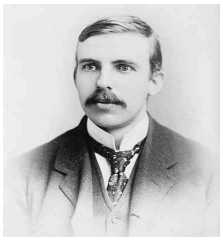
named after Ernest Lawrence

- Is radioactive and very unstable. It only exits for a few minutes after it is created.
- Lawrence was the inventor of the cyclotron machine that was used to discover elements heavier than uranium.

Rf 104

Rutherfordium **261**

named after Ernest Rutherford

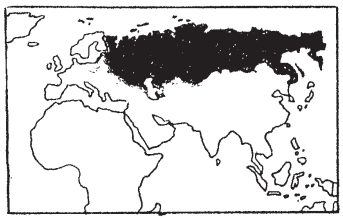


- Is very radioactive and unstable.
- Is made in nuclear reactors.
- No commerical use.
- Rutherford was a famous physicist.

Db 105

Dubnium **262**

named after Dubna, Russia



- Was made in a reactor in Russia.
- Is very radioactive and very unstable.
- Only exits for a few minutes.

Sg 106

Seaborgium **263**

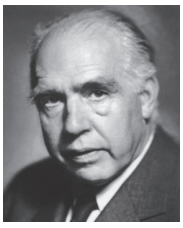
named after Glenn T. Seaborg

- Is very radioactive and unstable
- Is made in nuclear reactors.
- No commerical use.
- Only exits for a few seconds.
- Seaborg and his team discovered Pu, Am, Cm, Bk, Cf, Es, Fm, Md and No.

Bh 107

Bohrium **262**

named after Niels Bohr

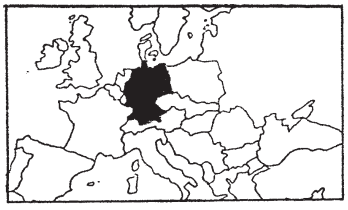


- Extremely radioactive and unstable.
- No commercial use.
- Only exists for a fraction of a second.
- Niels Bohr figured out atomic structure and also studied the nature of light.

Hs 108

Hassium **265**

named after Hesse, Germany



- Extremely radioactive and unstable.
- Made in nuclear reactors.
- No commericial use.
- Only exists for a fraction of a second.