True or False

H: Hydrogen

1

The light of stars is produced by the stars' transmutation of hydrogen into helium.

True or False?

Answer: True

He: Helium

2

The element helium is produced naturally on earth by the radioactive decay of the elements thorium and uranium.

True or False?

Answer: True

Li: Lithium

3

The country of Bolivia is a plentiful source of the element lithium.

True or False?

Answer: True

Be: Beryllium

4

Like many metals, the element beryllium is opaque to x-rays.

True or False?

Answer: False—beryllium is actually transparent to x-rays—but not to visible light, unfortunately.

B: Boron

5

The element boron is used in the toy Silly Putty.

True or False?

Answer: Yes, it's true!

C: Carbon

6

The element carbon can be found in space in the form of spherical Bucky Balls (C_{60}).

True or False?

Answer: True

N: Nitrogen

7

The Haber process converts nitrogen (N_2) from the air into ammonium (NH_4^+)

True or False?

Answer: False—the main product of the Haber process is ammonia (NH_3).

O: Oxygen

8

Under certain conditions, life-giving oxygen (O_2) gas can actually be toxic.

True or False?

Answer: True

F: Fluorine

9

Although fluorine is the most reactive non-metallic element, it will not react with neon.

True or False?

Answer: True

Ne: Neon

10

The noble gas neon is the most unreactive element.

True or False?

Answer: True; bonus fact—neon is even less reactive than helium!

Na: Sodium

11

The element sodium is soft enough to be sliced a knife, although it is a metal.

True or False?

Answer: True

Mg: Magnesium

12

The element magnesium plays a key role in the hydrolysis of ATP (adenosine triphosphate), the molecule which provides our energy.

True or False?

Answer: True

Al: Aluminum

13

The element aluminum was once considered a precious metal.

True or False?

Answer: True

Si: Silicon

14

The element silicon is essential to computers and sea-sponges alike.

True or False?

Answer: True

P: Phosphorus

15

The element phosphorus is an important component of DNA.

True or False?

Answer: True

S: Sulfur

16

Pure sulfur is dangerous to handle.

True or False?

Answer: False—Pure sulfur is mildly toxic, and contrary to popular belief, doesn't smell either!

Cl: Chlorine

17

The element chlorine is found in in stomach acid, which helps to digest proteins.

True or False?

Answer: True

Ar: Argon

18

If an electric current is passed through it, the element argon glows bright purple.

True or False?

Answer: False—argon glows light-blue when an electric current is passed through it.

K: Potassium

19

The element potassium is used in types of plant fertilizer.

True or False?

Answer: True

Ca: Calcium

20

The element calcium is a component of soap scum.

True or False?

Answer: True

Sc: Scandium

21

The obscure metal scandium is actually used in lacrosse sticks.

True or False?

Answer: True

Ti: Titanium

22

Although a metal of industry, the element titanium is actually used in jewelry.

True or False?

Answer: True

V: Vanadium

23

Most ions containing the element vanadium are blandly colored.

True or False

Answer: False—many vanadium ions and complexes are vividly colorful.

Cr: Chromium

24

The element chromium may play a role in the function of insulin.

True or False?

Answer: True

Mn: Manganese

25

Manganese plays a vital role in the photosynthetic water-splitting process that produces O_2 gas.

True or False?

Answer: True and vital to our very existence (no O_2 = death)!

Fe: Iron

26

Iron is the 10^{th} most common element in the entire universe.

True or False?

Answer: False—iron ranks 6^{th} in universal elemental abundance.

Co: Cobalt

27

Although an obscure metal, the element cobalt is a component of vitamin B_{12}.

True or False?

Answer: True

Ni: Nickel

28

The element nickel is a component of stainless steel.

True or False?

Answer: True

Cu: Copper

29

Copper is the best electrical conductor of all the elements.

True or False?

Answer: False—the element silver is actually the best electrical conductor; copper comes in 2nd.

Zn: Zinc

30

The element zinc is a critical cofactor to hundreds of enzymes (biochemical catalytic proteins).

True or False?

Answer: True

Ga: Gallium

31

Although it is a metal, the element gallium will melt in a person's hand.

True or False?

Answer: True

Ge: Germanium

32

The element germanium is an essential mineral for humans.

True or False?

Answer: False—there is slight evidence for germanium's essentiality in humans, but nothing convincing.

As: Arsenic

33

The toxic element arsenic was once used in a pigment to color antique wallpaper green.

True or False?

Answer: True

Se: Selenium

34

Every day, the element essential trace element selenium helps to protect our cells from damage by free radicals (i.e., oxidative stress).

True or False?

Answer: True; bonus fact—selenium is found the antioxidant enzyme glutathione peroxidase.

Br: Bromine

35

The element bromine is a fuming, reddish-brown liquid with a very disgusting odor at room temperature.

True or False?

Answer: True

Kr: Krypton

36

The element krypton can be used to improve the efficiency of lightbulbs.

True or False?

Answer: True

Rb: Rubidium

37

The element rubidium's applications include high-accuracy atomic clocks.

True or False?

Answer: True

Sr: Strontium

38

The element strontium is a component of the skeleton of certain sea-sponges.

True or False?

Answer: True

Y: Yttrium

39

The obscure element yttrium is a component of a class of alloys which are used to produce lasers.

True or False?

Answer: It's true and really cool too!

Zr: Zirconium

40

The element zirconium's applications include usage in durable coating for nuclear reactor fuel rods.

True or False?

Answer: True

Nb: Niobium

41

Because of its toxic nature, the element niobium is never used in applications which involve exposure to the body.

True or False?

Answer: False—niobium is an element of low toxicity and is often used in body piercings.

Mo: Molybdenum

42

Certain types of bacteria use the element molybdenum in enzymes which “fix” atmospheric nitrogen (N_2) into a form that plants can use.

True or False?

Answer: True

Tc: Technetium

43

Although a low atomic number element, technetium is radioactive and not found in nature.

True or False?

Answer: False—technetium *is* radioactive but found in nature in trace amounts.

Ru: Ruthenium

44

The element ruthenium is sometimes used to split H_2O as an alternative to electrolysis.

True or False?

Answer: True

Rh: Rhodium

45

Rhodium has the best reflectivity of any element.

True or False?

Answer: False—silver is actually the most reflective element, with rhodium coming in 2nd.

Pd: Palladium

46

The element palladium is excellent at absorbing hydrogen gas (H_2).

True or False?

Answer: True

Ag: Silver

47

The element silver was once more valuable that gold.

True or False?

Answer: True

Cd: Cadmium

48

The highly toxic element cadmium has no biological role whatsoever.

True or False?

Answer: False—a cadmium-containing enzyme has been found in a marine diatom.

In: Indium

49

Like many metals, the element indium is found exclusively in the form of minerals.

True or False?

Answer: False—pure indium metal has been found in Russia.

Sn: Tin

50

Under 55°F, the element tin's crystal structure changes, transforming it into a gray powder.

True or False?

Answer: True

Sb: Antimony

51

The element antimony was used by Johann Gutenberg in his invention of moveable type.

True or False?

Answer: True

Te: Tellurium

52

Exposure to microscopic amounts of the element tellurium results in terrible body odor.

True or False?

Answer: True

I: Iodine

53

The element iodine is a component of the vital thyroid hormones T_3 and T_4.

True or False?

Answer: True

Xe: Xenon

54

Although it is a noble gas and mostly chemically inert, the element xenon is an excellent anesthetic.

True or False?

Answer: True

Cs: Caesium

55

The element caesium, when combined with iodine, results in bendable crystals.

True or False?

Answer: True

Ba: Barium

56

The name “barium” means “heavy” and the element barium extremely dense.

True or False?

Answer: False—even titanium is denser than barium.

La: Lanthanum

57

An enzyme containing the element lanthanum is used by a certain type of bacteria to produce its energy.

True or False?

Answer: True

Ce: Cerium

58

The element cerium is quite an expensive metal, tending to its classification as a rare earth element.

True or False?

Answer: False—cerium is not that rare, ranking 27th in abundance of elements in the earth’s crust.

Pr: Praseodymium

59

Uses for the obscure element praseodymium include protective glassblower's eyeglasses.

True or False?

Answer: True

Nd: Neodymium

60

Extremely powerful neodymium magnets are used in wind-turbines.

True or False?

Answer: True

Pm: Promethium

61

The element promethium is used in to make glow-in-the-dark dials for watches.

True or False?

Answer: False—however, promethium used to be used in that application, due to its radioactivity

---

Sm: Samarium

62

Due to its neutron absorbing abilities, the element samarium is used in nuclear reactor control rods.

True or False?

Answer: True

Eu: Europium

63

Phosphors of the element europium are used in color TV screens to give them a red color.

True or False?

Answer: True; bonus fact—this phenomenon is somewhat unusual because most lanthanides find applications based on their magnetic properties.

Gd: Gadolinium

64

Surprisingly, a certain treatment method involving the element gadolinium has the ability to eradicate brain tumors.

True or False?

Answer: True; bonus fact—this property has made gadolinium one of my favorite lanthanides!

Tb: Terbium

65

Pieces of the element terbium can change their shape when they are put inside a magnetic field

True or False?

Answer: True

Dy: Dysprosium

66

Due to its expense and obscurity, the element dysprosium does not have any commercial applications.

True or False?

Answer: False—dysprosium salts are used in the lighting industry (as is the case with many lanthanides).

Ho: Holmium

67

Attaching a piece of holmium to the end of a magnet will strengthen it, due to holmium's intriguing magnetic properties.

True or False?

Answer: True

Er: Erbium

68

The element erbium is extremely important in modern technological communication networks (e.g. the internet).

True or False?

Answer: True

Tm: Thulium

69

A complicated alloy containing the element thulium is used in laser generation for in laser surgery.

True or False?

Answer: True

Yb: Ytterbium

70

In the crust of the earth, the element ytterbium is about 2 times as plentiful as tin 50.

True or False?

Answer: True

Lu: Lutetium

71

Unlike many lanthanide elements, lutetium was not discovered in Scandinavia.

True or False?

Answer: True

Hf: Hafnium

72

The element hafnium has the highest melting point of all elements.

True or False?

Answer: False—however, hafnium is one of the top 15 highest melting point elements.

Ta: Tantalum

73

The obscure element tantalum plays a crucial role in almost all electronic devices.

True or False?

Answer: True

W: Tungsten

74

The element tungsten has only a 0.10 density difference from gold.

True or False?

Answer: False—the density difference between the two elements is a mere 0.05.

Re: Rhenium

75

The Japanese scientist who discovered the element rhenium thought that he had discovered technetium (element 43) instead.

True or False?

Answer: True

Os: Osmium

76

The element osmium is often found combined with iridium in the “osmiridium” alloy.

True or False?

Answer: True

Ir: Iridium

77

Iridium is the densest element to have had its density measured.

True or False?

Answer: False—osmium is actually the densest element measured, with iridium coming in 2nd.

Pt: Platinum

78

The International Prototype Kilogram is made of 95% platinum.

True or False?

Answer: False—the IPK is made of 90% platinum, with iridium making up the other 10%.

Au: Gold

79

Nano-particles of the element gold have anti-cancer properties.

True or False?

Answer: True

Hg: Mercury

80

Research has shown that a certain type of bacteria seems to benefit from the presence of mercury.

Ture or False?

Answer: True; bonus fact—as for humans and animals however, mercury is anything but benign.

Tl: Thallium

81

The element thallium is highly toxic and has been used many times for murder.

True or False?

Answer: True

Pb: Lead

82

The element lead is one of the top ten densest elements.

True or False?

Answer: False—amazingly, lead isn't even on the list of the top 20 densest elements.

Bi: Bismuth

83

The element bismuth is the last stable (i.e., non-radioactive) element.

True or False?

Answer: False—but its half-life is ~19,000,000,000,000,000,000 years though!

Po: Polonium

84

The radioactive element polonium was once used to kill a Russian spy.

True or False?

Answer: True

At: Astatine

85

The radioactive element astatine is very frustrating to element collectors: it is extremely rare and decays quickly.

True or False?

Answer: True

Rn: Radon

86

Basements are sometimes inspected for the presence of dangerous radioactive radon gas.

True or False?

Answer: True

Fr: Francium

87

Although it is somewhat unknown, the radioactive element francium has a few applications besides scientific research.

True or False?

Answer: False— “There are no commercial applications for it [francium], even in medicine…”

(*The Elements*, Theodore Gray)

Ra: Radium

88

The radioactive element radium was discovered by Marie Curie.

True or False?

Answer: True

Ac: Actinium

89

Due to its extreme scarcity, the color of the radioactive element actinium remains unknown.

True or False?

Answer: False—actinium is colored silvery-white.

Th: Thorium

90

The radioactive element thorium was once used in a German brand of toothpaste.

True or False?

Answer: True

Pa: Protactinium

91

The radioactive element protactinium has some critically important applications, although they are not widely known.

True or False?

Answer: False—protactinium is extremely scarce and pretty much…useless.

U: Uranium

92

The first atomic bomb used in WWII was made with the radioactive element uranium.

True or False?

Answer: True

Np: Neptunium

93

The radioactive element neptunium is not naturally occurring.

True or False?

Answer: False—neptunium exists in nature in trace amounts, due to natural nuclear reactions.

Pu: Plutonium

94

During WWII, a professor once spilled all of the UK's radioactive plutonium supply.

True or False?

Answer: True—you can hear the whole story on www.periodicvideos.com !

Am: Americium

95

The radioactive element americium is probably in your house; americium is often used in smoke detectors.

True or False?

Answer: True

Cm: Curium

96

The radioactive element curium has been used as a heat source for Mars rovers and other spacecrafts.

True or False?

Answer: True

Bk: Berkelium

97

The radioactive element berkelium was used in the nuclear synthesis of element 117.

True or False?

Answer: True

Cf: Californium

98

Although a high-numbered radioactive element, californium is used in metal-detectors

True or False?

Answer: True

Es: Einsteinium

99

Like many radioactive high-numbered elements, einsteinium was first discovered by nuclear synthesis.

True or False?

Answer: False—einsteinium was first discovered in the fallout of a nuclear bomb.

Fm: Fermium

100

The radioactive element fermium was first synthesized by the famous scientist Enrico Fermi.

True or False?

Answer: False—fermium was first discovered in the fallout of a nuclear bomb, although the element is named after him.

Md: Mendelevium

101

The radioactive element mendelevium was first synthesized by bombarding einsteinium (element 99) with alpha particles (2 protons and 2 neutrons).

True or False?

Answer: True

No: Nobelium

102

The radioactive element nobelium is chemically similar to the rare earth element ytterbium, since it is found directly below ytterbium in the periodic table.

True or False?

Answer: True

Lr: Lawrencium

103

The radioactive element lawrencium is the last of the actinide elements.

True or False?

Answer: True

Rf: Rutherfordium

104

The radioactive element rutherfordium is found in the same period as actinium on the periodic table.

True or False?

Answer: True

Db: Dubnium

105

Although it is a super-heavy radioactive element, dubnium atoms can exist for over a day before decaying radioactively.

True or False?

Answer: True

Sg: Seaborgium

106

Due to its extreme instability, no compounds have ever been formed with the super-heavy radioactive element seaborgium.

True or False?

Answer: False—seaborgium hexacarbonyl has been produced.

Bh: Bohrium

107

There are no known compounds of the super-heavy radioactive element bohrium.

True or False?

Answer: False—BhO_3Cl has been produced.

Hs: Hassium

108

The radioactive element hassium is possibly the densest element on the entire periodic table.

True or False?

Answer: True; bonus fact—this would make sense because hassium is found below osmium in the periodic table.

Mt: Meitnerium

109

Compounds of the super-heavy radioactive element meitnerium have yet to be produced.

True or False?

Answer: True

Ds: Darmstadtium

110

The longest-lived isotope of the super-heavy radioactive element darmstadtium has a half-life of barely a minute.

True or False?

Answer: False—the answer is instead a mere 11 seconds!

Rg: Roentgenium

111

The radioactive element roentgenium is part of the column of elements that includes copper, silver and gold.

True or False?

Answer: True

Cn: Copernicium

112

Although a metal, the radioactive element copernicium may be a liquid at room temperature.

True or False?

Answer: True; bonus fact—this would make sense because copernicium is found directly below mercury (element 80) on the periodic table and mercury is a liquid metal at room temperature.

Nh: Nihonium

113

The super-heavy radioactive element nihonium is the only element to be discovered in Japan.

True or False?

Answer: True

Fl: Flerovium

114

Studies have shown that the super-heavy radioactive element flerovium is clearly a metallic solid at room temperature.

True or False?

Answer: False—in fact, it seems that flerovium behaves more like a noble gas.

Mc: Moscovium

115

The super-heavy radioactive element moscovium was discovered in Moscow, Russia, hence its name.

True or False?

Answer: False—the element was first synthesized in Dubna, Russia.

Lv: Livermorium

116

Based on chalcogen (oxygen group) trends, the livermorium compound livermorane (LvH_2) should have a terrible smell.

True or False?

Answer: True

Ts: Tennessine

117

The element tennessine is part of the halogen column.

True or False?

Answer: True

Og: Oganesson

118

Oganesson—the element with the highest atomic number—was the last element to be discovered.

True or False?

Answer: False—tennessine (element 117) was actually discovered last.

A-B-C Multiple Choice

H: Hydrogen

1

Heavy water contains hydrogen with—

A: 2 extra neutrons.

B: 1 extra neutron.

C: 1 extra electron.

Answer: B

He: Helium

2

In 2016 a large supply of the element helium was found in—

A: Tanzania.

B: The Congo.

C: Angola.

Answer: A

Li: Lithium

3

The element lithium has an application in brain medications in the form of—

A: Lithium bi-carbonate.

B: Lithium oxide.

C: Lithium carbonate.

Answer: C

Be: Beryllium

4

Beryllium is a—

A: Toxic element.

B: Cheap element.

C: All of the above.

Answer: A

B: Boron

5

The element boron is the only metalloid—

A: In the period that it's in.

B: Essential to plants.

C: All of the above.

Answer: C

C: Carbon

6

Which of these forms of the element carbon is the best electrical conductor?

A: Diamond.

B: Carbon nanotubes.

C: Graphite.

Answer: B

N: Nitrogen

7

When poured onto the floor, liquid nitrogen forms—

A: Bubbles that can move across the floor.

B: A puddle, just like H_2O would do.

C: Bubbles that stay where they are.

Answer: A

O: Oxygen

8

Liquid oxygen is—

A: Magnetic.

B: Cold.

C: All of the above.

Answer: C

F: Fluorine

9

A number of organo-fluorine compounds (molecules containing the C—F bond) constitute—

A: An important class of antibiotics.

B: An important class of anti-viral agents.

C: All of the above.

Answer: A; there are also organo-fluorine drugs which target cancer—fluorine is awesome!

Ne: Neon

10

With the help of electricity, the element neon glows—

A: Bright yellow.

B: Orange-red.

C: Greenish.

Answer: B

Na: Sodium

11

During the flame test for sodium metal, the element sodium burns with a—

A: Yellow flame.

B: Red flame.

C: Blue flame.

Answer: A

Mg: Magnesium

12

In a chlorophyll-a molecule there are/is—

A: 3 atoms of magnesium.

B: 2 atoms of magnesium.

C: 1 atom of magnesium.

Answer: C

Al: Aluminum

13

The aluminum from aluminum containing ores is often isolated in—

A: Norway.

B: Iceland.

C: Sweden.

Answer: B

Si: Silicon

14

The element silicon is found in—

A: Asbestos.

B: Mica.

C: All of the above.

Answer: C

P: Phosphorus

15

The formula for the biologically essential phosphate group is—

A: PO_4^{3-}

B: PO_4^{2-}

C: PO_3^{4-}

Answer: A

S: Sulfur

16

Elemental sulfur is found in the form of—

A: S_6 rings.

B: S_8 rings.

C: All of the above.

Answer: C

Cl: Chlorine

17

Which one of these sweeteners contains the element chlorine?

A: Sucralose.

B: Saccharin.

C: Stevia.

Answer: A

Ar: Argon

18

The element argon makes up—

A: Almost 0.01% of the total atmosphere.

B: Almost 0.1% of the total atmosphere.

C: Almost 1% of the total atmosphere.

Answer: C

K: Potassium

19

Which of these fruits have high potassium content?

A: Mangos.

B: Bananas.

C: Guavas.

Answer: B

Ca: Calcium

20

Common writing chalk is made of—

A: Calcium carbonate.

B: Calcium chloride.

C: Calcium sulfate.

Answer: C

Sc: Scandium

21

Certain “scandium compounds are now looking really quite promising for storage of…”*

A: Helium gas.

B: Hydrogen gas.

C: Chlorine gas.

Answer: B, *Professor Martyn Poliakoff, www.periodicvideos.com

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Ti: Titanium

22

Which of these titanium compounds is a white pigment?

A: Titanium dioxide.

B: Titanium monoxide.

C: Titanium nitride.

Answer: A

V: Vanadium

23

Which one/ones of these living organisms contain the element vanadium?

A: The human body.

B: Red and white mushrooms.

C: All of the above.

Answer: C

Cr: Chromium

24

The oxide of the element chromium is—

A: Is a rusty, brown color.

B: A vivid, green color.

C: A shiny, silvery color.

Answer: B

Mn: Manganese

25

Which of these is/are magnetic?

A: Manganese sulfate.

B: Manganese metal.

C: All of the above.

Answer: A

Fe: Iron

26

The infamous “Fools Gold” (a.k.a. pyrite) is made out of—

A: Iron aluminum sulfate.

B: Iron sulfate.

C: Iron sulfite.

Answer: B—this is a tricky one; there is, however, a difference between sulfate and sulfite.

Co: Cobalt

27

Small amounts of cobalt compounds give glass a—

A: Violet color.

B: Teal-blue color.

C: Blue color.

Answer: C

Ni: Nickel

28

A nickel coin is—

A: Around 25% nickel.

B: Around 30% nickel.

C: Around 50% nickel.

Answer: A

Cu: Copper

29

While the element iron is found in the O_2 carrying hemoglobin molecule for humans, the element copper is found in the O_2 carrying molecule for—

A: Lobsters.

B: Spiders.

C: All of the above.

Answer: C

Zn: Zinc

30

Pennies were made with a core of the element zinc after the year—

A: 1984

B: 1982

C: 1980

Answer: B

Ga: Gallium

31

The element gallium's applications include—

A: LED lights.

B: Thermometers.

C: All of the above.

Answer: C

Ge: Germanium

32

The element germanium can be found in—

A: Dietary supplements.

B: The human body in substantial amounts.

C: All of the above.

Answer: A

As: Arsenic

33

The element arsenic is a—

A: Essential for human life.

B: Metalloid.

C: None of the above.

Answer: B; bonus fact—arsenic has been shown to be essential for animals such as chickens.

Se: Selenium

34

High levels of selenium (element 34) in soil can be indicated by large amounts of—

A: Locoweed.

B: Horseweed.

C: Pigweed.

Answer: A; bonus fact—brazil nuts also contain high amounts of selenium.

Br: Bromine

35

The element bromine can be found in—

A: Children's pajamas.

B: Hot tubs.

C: All of the above.

Answer: C

Kr: Krypton

36

The element krypton composes—

A: 0.000100% of the atmosphere.

B: 0.000114% of the atmosphere.

C: 0.000118% of the atmosphere.

Answer: B

Rb: Rubidium

37

The element rubidium's applications include—

A: Fireworks.

B: Physics experiments.

C: All of the above.

Answer: C

Sr: Strontium

38

During the flame test for strontium metal, the element strontium burns with a—

A: Red flame.

B: Orange flame.

C: Yellow flame.

Answer: A

Y: Yttrium

39

Which of these compounds of yttrium (element 39) is a famous super-conductor material?

A: Yttrium barium nickel oxide.

B: Yttrium barium copper oxide.

C: Yttrium barium zinc oxide.

Answer: B

Zr: Zirconium

40

The element zirconium's applications include—

A: Fake diamonds.

B: Knives made of ceramic.

C: All of the above.

Answer: C

Nb: Niobium

41

The element niobium—

A: Has applications which include rocket nozzles.

B: Is the 40^{th} most common element in the earth's crust.

C: All of the above.

Answer: A

Mo: Molybdenum

42

The element molybdenum is found in—

A: The bacterial enzyme nitrogenase.

B: The blades of some ancient Samurai swords.

C: All of the above.

Answer: C

Tc: Technetium

43

When needed for medical purposes, the radioactive element technetium is created using a device containing a radioactive form of—

A: Niobium, element 41.

B: Molybdenum, element 42.

C: Ruthenium, element 44.

Answer: B; bonus fact—this device is colloquially known as “moly cow”.

Ru: Ruthenium

44

Finely divided ruthenium, which has catalytic applications, is—

A: Gray.

B: Silver.

C: Black.

Answer: C

Rh: Rhodium

45

The element rhodium can be found in—

A: Pacemakers for the heart.

B: Only the most expensive jewelry.

C: All of the above.

Answer: A

Pd: Palladium

46

Strangely, the element palladium is used to mimic silver, although it is about—

A: 10 times as expensive.

B: 15 times as expensive.

C: 20 times as expensive.

Answer: C

Ag: Silver

47

The element silver has—

A: Applications which include usage in photography film.

B: Antibacterial properties.

C: All of the above.

Answer: C

Cd: Cadmium

48

The element cadmium has commonly been used in batteries along with—

A: Lithium.

B: Nickel.

C: All of the above.

Answer: B

In: Indium

49

Although an obscure element, indium is an important component of computer screens in the form of—

A: Indium copper oxide.

B: Indium tin oxide.

C: All of the above.

Answer: B

Sn: Tin

50

The element tin is a component of—

A: Bronze.

B: Solder that does not contain lead.

C: All of the above.

Answer: C

Sb: Antimony

51

The element antimony—

A: Has an oxide which has an application as an additive to PVC plastic (think PVC pipes)

B: A dangerously toxic metalloid with an atomic number divisible by 17.

C: All of the above.

Answer: C; Option B is not strictly a science question, but you must know your 17 times tables!

Te: Tellurium

52

Although a rather obscure element, tellurium—

A: Has an application in DVD-RW discs.

B: Can be found in some amino acids in fungi.

C: All of the above.

Answer: C; bonus fact—"Tellurium has no biological function, although fungi can use it in place of sulfur and selenium in amino acids such as telluro-cysteine and telluro-methionine" (https://en.wikipedia.org/wiki/Tellurium#Biological_role).

I: Iodine

53

Iodine has the highest atomic number of—

A: All elements necessary for human life

B: Halogens that are liquid at room temperature

C: All of the above

Answer: A

Xe: Xenon

54

“Xenon is obtained commercially as a by-product of the separation of air into…”*—

A: Oxygen and H_2O vapor.

B: Oxygen and nitrogen.

C: All of the above.

Answer: B, *https://en.wikipedia.org/wiki/Xenon.

Cs: Caesium

55

Caesium can be used to provide an exact definition of—

A: The second.

B: The meter.

C: The gram.

Answer: A

Ba: Barium

56

During the flame test for barium metal, barium burns with a—

A: Green flame.

B: Pink flame.

C: Blue flame.

Answer: A

La: Lanthanum

57

Even though it is the first of the “rare earth” elements, lanthanum is more abundant in the earth’s crust than—

A: Copper.

B: Lead.

C: All of the above.

Answer: B

Ce: Cerium

58

The element cerium—

A: Has applications which include self-cleaning ovens.

B: Can produce sparks when struck.

C: All of the above.

Answer: C

Pr: Praseodymium

59

The obscure element praseodymium (element 59) has been used in a silicate which can lower the speed of light to a speed as low as—

A: 300 m per sec.

B: 200 m per sec.

C: 100 m per sec.

Answer: A

Nd: Neodymium

60

Neodymium can be found in—

A: Older laser pointers which give red light.

B: More popular laser pointers which give green light.

C: All of the above.

Answer: B

Pm: Promethium

61

The element promethium is—

A: Radioactive and only found in nature in trace amounts.

B: Found in nature in substantial amounts.

C: Sometimes added in tiny amounts to metal cookware.

Answer: A

Sm: Samarium

62

A certain samarium containing magnet can function at higher temperatures than even the renowned neodymium magnets; which of these metal combinations is it?

A: Samarium iron magnets.

B: Samarium cobalt magnets.

C: Samarium nickel magnets.

Answer: B

Eu: Europium

63

The element europium's applications include—

A: Color televisions.

B: Lightbulbs.

C: All of the above.

Answer: C

Gd: Gadolinium

64

The element gadolinium is attracted to magnets at—

A: Temperatures below 1000°f.

B: Temperatures below approx. room temp.

C: Temperatures below the freezing point of H_2O (32°f).

Answer: B

Terbium

65

Terbium, a lanthanide element, can be found in the human body in—

A: Bones and kidneys.

B: Only bones.

C: Only kidneys.

Answer: A

Dysprosium

66

The element dysprosium can be found in—

A: Neutron-capturing control rods in nuclear reactors.

B: Himalayan sea salt.

C: All of the above.

Answer: C

Ho: Holmium

67

The element holmium can be found in—

A: Neutron-capturing control rods in nuclear reactors.

B: Laser producing devices.

C: All of the Above.

Answer: C

Er: Erbium

68

The element erbium is known to—

A: Stimulate nuclear fission.

B: Stop nuclear fission.

C: Slow down nuclear fission but not completely stop it.

Answer: B

Tm: Thulium

69

The obscure element thulium has applications which include—

A: Specialized engines for race cars.

B: The lighting industry, where it helps to produce green light.

C: All of the above.

Answer: B

Yb: Ytterbium

70

Out of the 15 lanthanide elements, ytterbium is—

A: The least abundant element.

B: The 2^{nd} least abundant element.

C: The 5^{th} most abundant element.

Answer: A

Lu: Lutetium

71

Lutetium, the last lanthanide element, has applications which include—

A: Cancer treatment.

B: The lighting industry.

C: All of the above.

Answer: C

Hf: Hafnium

72

The element hafnium's applications include—

A: Metal-cutting plasma torches.

B: Mechanisms in air compressors.

C: All of the above.

Answer: A

Ta: Tantalum

73

The element tantalum has—

A: Had boycotts formed against it.

B: An atomic number with a digital root of 1.

C: All of the above.

Answer: C; when you have time, look up what a digital root is.

W: Tungsten

74

The element tungsten has—

A: The highest melting point of all elements.

B: Been found in some enzymes in lower enzymes.

C: All of the above.

Answer: C

Re: Rhenium

75

Rhenium's applications include jet engine turbine blades, where it can be found in quantities of approximately—

A: 6%

B: 12%

C: 15%

Answer: A

Os: Osmium

76

The element osmium has—

A: An extremely faint bluish hue.

B: An oxide which has a smell (which surprising for a metal).

C: All of the above.

Answer: C

Ir: Iridium

77

The element iridium—

A: Is the most corrosion-resistant element.

B: Has been found concentrated in a thin but world-wide clay layer.

C: All of the above.

Answer: C

Pt: Platinum

78

The element platinum is a component of one of the best anti-cancer drugs, a small molecule which—

A: Is known as cis-platin.

B: Also contains chlorine.

C: All of the above.

Answer: C

Au: Gold

79

“All the gold ever mined in the history of the human race would fit into a cube…”*—

A: With edges of about 60 feet.

B: With edges of about 80 feet.

C: With edges of about 100 feet.

Answer: A, * *The Elements,* Theodore Gray.

Hg: Mercury

80

Which of these metals can float on mercury?

A: Silver.

B: Lead.

C: All of the above.

Answer: C

Tl: Thallium

81

In the earth's crust, the toxic element thallium is about 20 times less abundant than—

A: Selenium.

B: Praseodymium.

C: All of the above.

Answer: B

Pb: Lead

82

The element lead has—

A: Applications which include car batteries.

B: Caused the death of famous composer Franz Schubert.

C: None of the above.

Answer: A

Bi: Bismuth

83

The element bismuth—

A: When alloyed with cadmium (and a few other elements), is used as a cap for fire sprinklers.

B: Has applications which includes medicine for upset stomachs.

C: All of the above.

Answer: C; bonus fact—this bismuth alloy (a. k. a. “Wood’s Metal”) is used in this particular way because of its low melting point.

Po: Polonium

84

The radioactive element polonium—

A: Has applications which include anti-static brushes.

B: Is one of the top ten densest elements.

C: All of the above.

Answer: A

At: Astatine

85

The color of the radioactive element astatine is—

A: Unknown.

B: Silvery.

C: Gray.

Answer: A

Rn: Radon

86

The primary source of radon gas in nature is—

A: Bedrock.

B: Granite.

C: Obsidian.

Answer: B

Fr: Francium

87

The color of the element radioactive francium is—

A: Grayish-silver.

B: Unknown.

C: None of the above.

Answer: B

Ra: Radium

88

The color of the radioactive element radium is—

A: Gray.

B: Unknown.

C: None of the above.

Answer: C

Ac: Actinium

89

The radioactive element actinium—

A: Is even more hazardous than plutonium.

B: Glows green in dark surroundings.

C: All of the above.

Answer: A; bonus fact—in the dark, actinium glows blue.

Th: Thorium

90

In the earth's crust, the radioactive element thorium is—

A: More than 4 times as plentiful as uranium.

B: More than 3 times as plentiful as uranium.

C: About as plentiful as uranium.

Answer: B

Pa: Protactinium

91

A small handful of the radioactive element protactinium would—

A: Decay away in merely a few minutes.

B: Be hard to obtain, due to its high scarcity.

C: All of the above.

Answer: B

U: Uranium

92

The radioactive element uranium—

A: Exists in nature in two isotopes.

B: Is legal to own to a maximum of 10 lbs.

C: All of the above.

Answer: A; bonus fact— “Pure uranium metal is perfectly legal to own (up to 15 pounds at any one time)…” (*The Elements*, Theodore Gray).

Np: Neptunium

93

The radioactive element neptunium is one of the—

A: Top 5 densest elements.

B: Top 3 densest elements.

C: None of the above.

Answer: A

Pu: Plutonium

94

Most of the world’s supply of the radioactive element plutonium is kept in California in—

A: Calabasas.

B: Los Alamos.

C: None of the above.

Answer: B

Am: Americium

95

The radioactive element americium is a powerful emitter of—

A: Alpha particles.

B: Gamma rays.

C: All of the above.

Answer: C

Cm: Curium

96

The radioactive element curium was discovered by—

A: A team of nuclear scientists.

B: Marie Curie.

C: Pierre Curie.

Answer: A

Bk: Berkelium

97

A visible amount of the radioactive element berkelium has—

A: Never been created.

B: Been created.

C: Been created and stolen.

Answer: B (thankfully not C).

Cf: Californium

98

The radioactive element californium is—

A: A powerful emitter of neutrons.

B: A beta-particle emitter.

C: All of the above.

Answer: C

Es: Einsteinium

99

The radioactive element einsteinium was first discovered during—

A: World War II.

B: The 1950s.

C: The 1970s.

Answer: B

Fm: Fermium

100

The radioactive element fermium was discovered in—

A: Nuclear bomb debris.

B: A particle accelerator.

C: A nuclear reactor.

Answer: A

Md: Mendelevium

101

Although not discovered by the great Dimitri Mendeleev himself, the radioactive element mendelevium was discovered by—

A: Mendeleev's son.

B: Mendeleev's grandson.

C: A research team.

Answer: C

No: Nobelium

102

The radioactive element nobelium was discovered by—

A: Alfred Nobel.

B: A team of Swedish scientists.

C: None of the above.

Answer: C; bonus fact—The first discovery of nobelium was reported by a team of Swedish scientists, but because their work was not able to be replicated, the credit for the discovery was eventually given to a team of Berkeley scientists; quite a mouthful!

Lr: Lawrencium

103

The radioactive element radioactive lawrencium was discovered by—

A: Ernest Lawrence.

B: A team of Berkeley scientists.

C: None of the above.

Answer: B

Rf: Rutherfordium

104

The super-heavy radioactive element rutherfordium was discovered by—

A: American Scientists.

B: Russian Scientists.

C: German Scientists.

Answer: A; bonus fact—the Russian claims for the discovery of rutherfordium were rejected.

Db: Dubnium

105

The name of the super-heavy radioactive element dubnium was changed to dubnium from—

A: Zeusium.

B: Hahnium.

C: Dobnium.

Answer: B; bonus fact—On the periodic table, dubnium is part of the column containing elements named for Greek gods; Theodore Gray, author of the delightful book, *The Elements*, thinks Zeusium would have been an excellent name for dubnium.

Sg: Seaborgium

106

The super-heavy radioactive element seaborgium—

A: Is found in the same column as titanium on the periodic table.

B: Was discovered by Glenn T. Seaborg's research team.

C: None of the above.

Answer: C

Bh: Bohrium

107

The super-heavy radioactive element Bohrium was first discovered in laboratories in—

A: Germany.

B: Russia.

C: The United States.

Answer: A

Hs: Hassium

108

The super-heavy radioactive element hassium—

A: Was discovered in Darmstadt, Germany.

B: Is in the same group as iron on the periodic table.

C: All of the above.

Answer: C

Mt: Meitnerium

109

The super-heavy radioactive element meitnerium—

A: Is found in the same column as the densest element on the periodic table.

B: Was first made by accelerating iron atoms into bismuth target.

C: All of the above.

Answer: B

Ds: Darmstadtium

110

The super-heavy radioactive element darmstadium was first made by accelerating—

A: Atoms of nickel into a lead target.

B: Atoms of copper into a thallium target.

C: Atoms of zinc into a target of solid mercury.

Answer: A

Rg: Roentgenium

111

The super-heavy radioactive element roentgenium was first made by—

A: Scientists in Japan.

B: Accelerating nickel atoms into a bismuth target.

C: All of the above.

Answer: B

Cn: Copernicium

112

The super-heavy radioactive element coperniucium was first made by—

A: Accelerating atoms of copper into a bismuth target.

B: Accelerating atoms of zinc into a lead target.

C: Accelerating atoms of arsenic into a thin target of gold.

Answer: B

Nh: Nihonium

113

The super-heavy radioactive element nihonium was the first element to be synthesized in—

A: Japan

B: India.

C: China

Answer: A

Fl: Flerovium

114

The super-heavy radioactive element flerovium was first made by—

A: Accelerating calcium atoms into a plutonium target.

B: Scientists in Sweden.

C: All of the above.

Answer: A

Mc: Moscovium

115

The super-heavy radioactive element moscovium is found on the periodic table in the same column—

A: As phosphorus.

B: As aluminum.

C: None of the above.

Answer: A

Lv: Livermorium

116

Russian and American Laboratories announced that they had discovered the super-heavy radioactive element livermorium in—

A: 2000

B: 2001

C: 2002

Answer: B

Ts: Tennesine

117

Tennessine—the element with the 2nd highest atomic number—was discovered in—

A: 2005

B: 2010

C: 2012

Answer: B

Og: Oganesson

118

The super-heavy radioactive element oganesson was—

A: Announced to have been discovered in 1999.

B: Made by accelerating calcium atoms into a californium target.

C: All of the above.

Answer: C; bonus fact—Eventually, the 1999 announcement was proven to be false; element 118 had in fact not been discovered at that time.
