

# Free Reading Sample

Magical Elements of the Periodic Table

Presented By

## The Actinide



*By Sybrina Durant with Illustrations by Various Artists*

# Actinide Knights present “Magical Elements Of The Periodic Table.”

In this periodic table book, 14 Actinide Knights present Magical Elements of the Periodic Table. Each knight wields a magical sword or lance<sup>3</sup> tipped with an element which gives them unique powers.



Acamus starts out the book of the Actinide Knights Wizards by introducing the radioactive element Actinium on his element page.

Thordis rounds out the 'book's elements by presenting facts and other fun information about the metal, Thorium on her element page.



Another elemental favorite is Elizama, who represents Einsteinium. It gives her the power to shoot lightening bolts from her lance and to make protective shields out of energy.



Calastian and his Californium sword are truly magical. When Calastian pulls out his sword, it makes a mysterious noise and shines with a cool blue light that crackles with power. He can use it to call water to rise up or fall to defeat his enemies.

The Actinide Knights, along with their techno-magical unicorn, dragon and wizard friends from the first 4 Magical Elements Books are the perfect group to introduce you to metals and other elements in the Periodic Table. Hopefully, the Magical Elements of this periodic table book will spark an interest in the magical and real world properties of all the metals and other elements known today. You may be surprised at how prominently they feature in our every day lives.

Each element page in this book contains terms that might not be completely familiar to the reader. Refer to the definitions in the back of the book to get a clear understanding of each meaning.

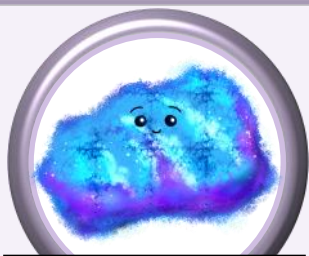
There is also a fun elemental themed Periodic Table at the back of the book. It features metal horn unicorns, dragons with element tipped tails, wizards and knights with elemental staffs and swords; and radiated goblins.

Remember, “No metal – No Magic. . .and No Technology”.

It's Techo-Magical.

Note: The reference page for all entries in this periodic table book is at [MagicalPTElements.com/MW1PT](http://MagicalPTElements.com/MW1PT). Follow [sybrinablueunicorn](#) on Instagram, [The Blue Unicorn Book Store](#) on Facebook, [@sybrinad](#) on Pinterest, [Sybrina\\_SPT](#) on Twitter; and [Sybrina Durant](#) on LinkedIn.



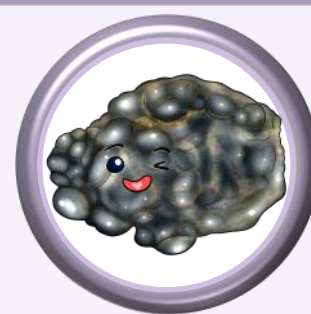


### Actinium Facts

- Discovered in 1899 in Paris
- Silvery white metal
- Radioactivity makes it glow an eerie blue
- No electrical conductivity
- No magnetic properties
- Actinide Metal

## Acamus Presents Actinium

Symbol: Gd Atomic Number: 64 Atomic Mass: 157.3

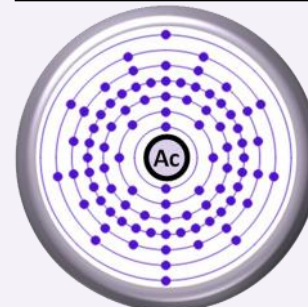


Actinium is not found in large quantities in nature but some common ores are Uraninite and Thorite. It is primarily produced through the neutron bombardment of radium in nuclear reactors. The radium absorbs a neutron and undergoes beta decay to form actinium.



### Acamus' Magical Abilities

Acamus uses his sword to control the powers of Actinium. It can create icy winds to stop bad guys or shoot lightning to hit targets perfectly. He can also use it to make shields of blue light to protect himself and his friends.



### Atomic Structure

### Uses For Actinium

There are very few current uses for Actinium but as the first element in the actinide series, it shares many chemical properties with the lanthanides, particularly lanthanum. Forward thinkers propose some interesting commercial potentials for its use in the future.

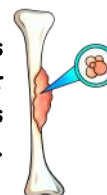
Futuristic cars might use Actinium isotopes in massive HEPA rated automotive air filters.



Actinium isotopes could be used in autonomous military robots for long-range missions.



Actinium-225 has been used to target cancerous bone cells for treatment.



Actinium-powered energy sources could be used for off-grid applications.



Actinium isotopes might be used to break down contaminants in water supplies.



Actinium isotopes are actively being researched for minimally invasive radiation treatments.

### Did You Know?

- Actinium is the first element in the actinide series. The name actinide is derived from the word Actinium.
- The word "actinium" from the Greek "aktis," which means "sunbeam" — an allusion to its high radioactivity.
- Actinium-227 emits beta particles with so much energy that it lights up the surrounding environment with a blue glow. In a sense, due to its high levels of radioactivity, it is vibrating faster than the speed of light and the blue glow is like a sonic boom.
- The only naturally occurring isotope of actinium is  $^{227}\text{Ac}$ . Thirty-six radioisotopes of actinium have been identified, all with half-lives ranging from 69 nano seconds at the shortest (for  $^{217}\text{Ac}$ ) to 21.77 years at the longest ( $^{227}\text{Ac}$ ).
- Actinium-225, is being used a new type of cancer treatment called targeted alpha therapy. As the atom decays, it releases particles that destroy the nearby cancer cells, but don't travel far enough to damage the rest of the body.



### Californium Facts

- Discovered in 1950 in Berkely, California
- Silvery-white, metal
- Unsuitable for use as electricity conductor due to radioactivity
- Magnetic properties change with temperature
- Malleable and ductile
- Actinide Metal

## Calastian Presents Californium

Symbol: Cf Atomic Number: 98 Atomic Mass: 251

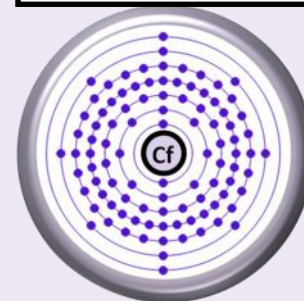


Using the High Flux Isotope Reactor (HFIR) reactor, neutrons are used to bombard berkelium-249, which forms berkelium-250. This element then quickly decays and forms Cf-250. Further neutron bombardment forms californium-252.



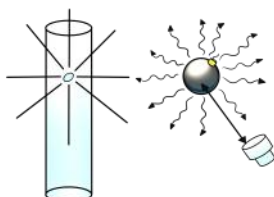
### Calastian's Magical Abilities

When Calastian wields his Californium-infused sword, it shines as a beacon of light against darkness. With its unique properties, he battles magical threats and malevolent creatures, safeguarding his kingdom and ensuring peace and safety for all.



### Atomic Structure

### Uses For Californium



Californium is used for Neutron Activation Analysis, a precision tool for identifying trace elements.



Californium neutron-based detectors may be used for analyzing extraterrestrial materials in space exploration.

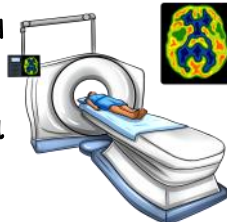


The study of magnetic relaxation in Californium could potentially offer insights into the relationship between magnetism and superconductivity.



Californium helps locate oil deposits and analyze geological formations through neutron activation analysis.

Californium is used in medical diagnostics to detect rare medical conditions using neutron emission.



Californium-fueled Next-Gen nuclear power plants will provide low-carbon energy.



### Did You Know?

- Californium is one of the few transuranium elements with practical uses. One is its use in metal detectors for finding silver and gold.
- Californium behaves a lot like the chemical element, Dysprosium, which is right above it on the periodic table. They have similar electron setups. This means they often form ions with a three-plus charge, which leads them to have similar oxidation states and patterns of reactivity.
- The first name for californium was "eka-dysprosium". Dmitri Mendeleev, the creator of the periodic table, used the prefix "eka" to denote an element that he predicted would occupy a position "one place away" (specifically, one element below) a known element in the same group of the periodic table.



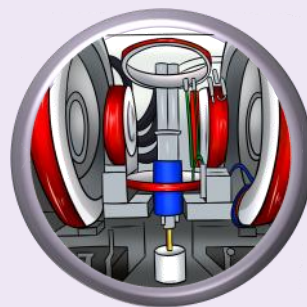


### Fermium Facts

- Discovered in 1952 in Berkeley, California
- Silvery metal
- Good conductor of heat and electricity.
- Likely to be paramagnetic
- Believed to be malleable
- Actinide Metal

## Ferley Presents Fermium

Symbol: Fm Atomic Number: 100 Atomic Mass: 257

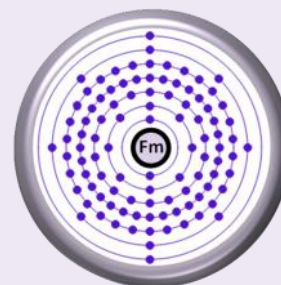


Fermium is produced by the bombardment of lighter actinides with neutrons in a nuclear reactor. Fermium-257 is the heaviest isotope that is obtained via neutron capture, and can only be produced in picogram quantities.



### Ferley's Magical Abilities

With a swipe of his sword, Ferley can accelerate the aging process of organic matter, causing enemy plants or structures to decay rapidly, weakening the enemy's defenses or trapping foes in a rapidly deteriorating environment.



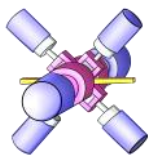
### Atomic Structure



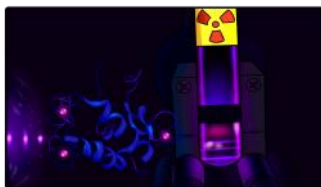
### Uses For Fermium

Due to its scarcity and the short half-lives of its isotopes (20.07 hours), Fermium has no current practical uses outside of basic scientific research. Scientists suspect it would behave like a metal and be able to form compounds, if enough could be created and if it lasted longer.

Actinide chemical studies of Fermium expands knowledge in the chemistry of actinide elements.

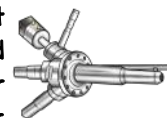


Fermium's neutron absorption properties are used in neutron capture cross-section studies.



Fermium is used in research for understanding about the stability of heavy nuclei.

Fermium-laden target materials - Fermium is used in creating targets for bombardment by lighter elements.



Fermium is used in developing techniques for isolating and analyzing radioactive elements.



Fermium's discovery helps in analyzing residues from nuclear explosions.

### Did You Know?

- Fermium was discovered unexpectedly along with Einsteinium in debris from the first hydrogen bomb test, codenamed 'Mike', which took place in the Pacific on October 31, 1952. The debris was collected on filter papers attached to drone airplanes that flew through the explosion area. Later, to obtain more material, many hundreds of pounds of coral from the blast area were examined.
- While pure fermium metal has not yet been produced, it is predicted to be a silvery metal similar to other actinides.
- Fermium is named after Enrico Fermi, who has been hailed as a founder of nuclear energy for his contributions of discovering the atomic bomb. He was renowned for being the creator of the world's first artificial nuclear reactor, the Chicago Pile-1, and a member of the Manhattan Project.



### Thorium Facts

- Discovered in 1828 in Stockholm, Sweden
- Light, silver gray metal
- Can conduct electricity
- Paramagnetic
- Malleable, but not very ductile
- Actinide Metal

## Thordis Presents Thorium

Symbol: Th Atomic Number: 90 Atomic Mass: 232

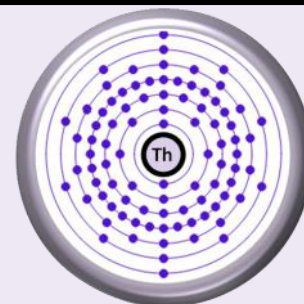


The main source of Thorium is mineral phosphate monazite, which contains about 3.1 %–11.34% of ThO<sub>2</sub> which has the highest percentage of thorium compared to other minerals like Thorite.



### Thordis' Magical Abilities

The intrinsic properties of thorium enhance her vision in low-light conditions, granting her the ability to see clearly in the dark, making her an exceptional tracker and scout.



### Atomic Structure

### Uses For Thorium



There is ongoing research into thorium-fueled (LPS) laser powered systems for engines for vehicles.

Thorium energy could help reduce greenhouse gas emissions.



Thorium will power future generations of submarines using thorium-based reactors.



Some countries are focusing on Non-Proliferation Treaties based on thorium power to avoid nuclear weapons proliferation.



Laser Optics – Thorium oxide can improve the performance of certain laser optics.

Thorium reactors offer carbon-free energy production.



### Did You Know?

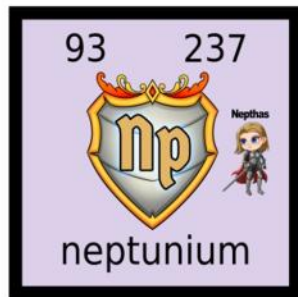
- Thorium's first major commercial use was for gas lamp mantles that were used as portable gas lighting, but these have since been replaced with safer alternatives. Coleman Lantern company even used it in their wicks.
- Thoriated toothpaste, especially the German brand Doramad, was a radioactive toothpaste marketed from the 1920s to the early 1940s. It contained thorium and falsely claimed health benefits such as improved gum circulation and germ destruction.
- Thorium was once used in many commercial and industrial products including everything from cigarettes to cat litter but it has been phased out of nearly all due to its high concentrations of radioactivity.
- The metal is malleable and may be extruded, rolled, forged, swaged, and spun, but it can not easily be drawn into wire.



# Alpha-Emitting Transuranic Actinide Elements

These elements are all synthetic, meaning they don't occur naturally on Earth, and are produced through nuclear reactions. They are all radioactive and decay by emitting alpha particles, among other decay modes, Transuranic or transuranium elements can be classified as technogenic nuclides, meaning it has been produced and released into the environment due to human nuclear activity.

These four elements are the most abundant and the most extensively used of the man-made actinide series elements. They comprise a major radioactive waste disposal concern because they are long lived and have high radiotoxicity. Neptunium and Plutonium are the only transuranium elements that have been found in trace amounts in nature.



**Neptunium**

2,100,000 Year Half  
Life



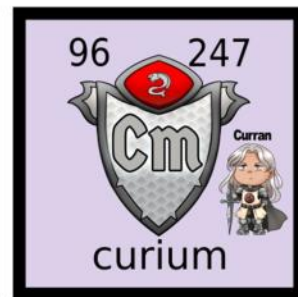
**Plutonium**

24,000 Year Half Life



**Americium**

458 Year Half Life



**Curium**

17.6 Year Half Life

These seven elements are produced in such small amounts, mostly for research purposes; and most of the isotopes produced have such short half-lives, a few seconds or minutes, that they are an unlikely health concern.



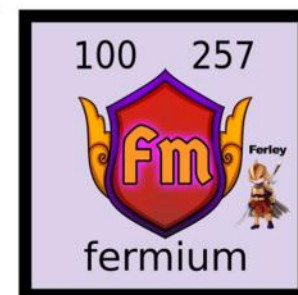
**Berkelium**



**Californium**



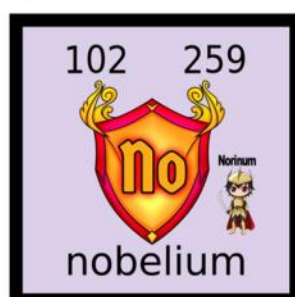
**Einsteinium**



**Fermium**



**Mendelevium**



**Nobelium**



**Lawrencium**



1  
1.008  
**H**  
hydrogen  
H101  
Textile Manufacturing

2  
3 6.94  
**Li**  
Lillian  
Batteries

4 9.012  
**Be**  
Berwyn  
Musical Instrument

3  
11 22.99  
**Na**  
Sorn  
Salt

12 24.31  
**Mg**  
Maggie  
In Your Bones

4  
19 39.10  
**K**  
Potassium  
Pearl  
Saline Crips

20 40.08  
**Ca**  
calcium  
Verly  
Teeth

5  
37 85.47  
**Rb**  
Rubidium  
Ruby  
Night Vision Glasses

38 87.62  
**Sr**  
Strawna  
Computer Screens

6  
55 132.9  
**Cs**  
caesium  
Caekoth  
Atomic Clocks

56 137.3  
**Ba**  
barium  
Barana  
Spark Plug

7  
87 223  
**Fr**  
francium  
Franchi  
Cancer Treatment

88 226  
**Ra**  
radium  
Raele  
Luminous Watches

Magical elements from the Magical Elements of the Periodic Table books present all of the elements of the periodic table in fantastical and real life terms.

In the books, each elemental character has magical powers based on the

properties of the elements that come from the land, air and water. They are the perfect group to introduce you to metals, metalloids, non-metals, halogens, noble gases and much more.

Unicorns, dragons, alchemists, knights, and goblins will show you how people of this world always have and always will depend upon the elements that our earth provides for all of our needs.

Use this Periodic Table as you would any other to spark an interest in the magical and real world properties of all the elements known today. You may be surprised at how prominently they feature in our every day lives.



Remember, "No Metal—No Magic."  
...And no technology.

13 10.81  
**B**  
boron  
Borleus  
Sports Equipment

14 12.01  
**C**  
carbon  
Cole  
Charcoal

15 14.01  
**N**  
nitrogen  
Nitra  
Food Packaging

16 16.00  
**O**  
oxygen  
Oxy  
Air

17 19.00  
**F**  
fluorine  
Fleure  
Strong Bones and Teeth

18 20.18  
**Ne**  
neon  
Jalan  
Advertising Signs

13 26.98  
**Al**  
aluminum  
Alumna  
Airplanes

14 28.09  
**Si**  
silicon  
Silonar  
Glass

15 30.97  
**P**  
phosphorus  
Phova  
Fertilizer

16 32.06  
**S**  
sulfur  
Xoe  
Matches

17 35.45  
**Cl**  
chlorine  
Klyde  
Swimming Pools

18 39.95  
**Ar**  
argon  
Arg  
Light Bulbs

31 69.72  
**Ga**  
gallium  
Gallant  
LED Displays

32 72.63  
**Ge**  
germanium  
Gemel  
Camera Lens

33 74.92  
**As**  
arsenic  
Arkyn  
Poison

34 78.97  
**Se**  
selenium  
Selenice  
Printers

35 79.90  
**Br**  
bromine  
Brogha  
Photography Film

36 83.80  
**Kr**  
krypton  
Krypio  
Detect Leaks

51 127.6  
**Sb**  
antimony  
Antz  
Flame Retardant Fabric

52 127.6  
**Te**  
tellurium  
Tellan  
Vulcanized Rubber

53 126.9  
**I**  
iodine  
Jody  
Cloud Seeding

54 131.3  
**Xe**  
xenon  
Xena  
Used To Catch Speeders

### SUPER HEAVY METALS—RADIOACTIVE

### RARE EARTH LANTHANIDE METALS

### ACTINIDE METALS

**It's  
Techno-  
Magical**

### LEGEND

Alkali Metals
Alkali Earth Metals
Transition Metals
Post-Transition (or Other Metals)
Metalloids
Non-Metals
Halogens
Noble Gases
Rare Earth Lanthanide Metals
Actinide Metals
Super Heavy—Radioactive

Alloys are created when 2 or more metals are combined. Compounds are created when 2 or more non-metals are combined.

### EXAMPLE OF A COMPOUND

Quincy Quick Lime =  
Used for Concrete

20 40.08  
**Ca**  
calcium  
Verly  
Teeth

8 16.00  
**O**  
oxygen  
Oxy  
Air

Both Carbon and Oxygen are reactive nonmetals.

### EXAMPLE OF AN ALLOY

White Wing

Used for jewelry, dental amalgams plus connectors, and switch and relay contacts for electronics.

White Gold

Includes 58.5 % gold, 22% copper, 8% zinc, 7% nickel, 4.5% silver and possibly other elements.

Sybrina.com



# Types of Elements On The Periodic Table

**Alkali Metals**—Some metals on the periodic table are soft and shiny—they're so soft you can actually cut them with a knife! These metals love to give away their electrons, which makes them super reactive. When they do, they form something called salt. Interestingly, you won't find these metals by themselves in nature; they need to be taken from other materials. Examples of these metals include lithium, sodium, potassium, rubidium, cesium, and francium.

**Alkali Earth Metals**—The elements in column 2 of the periodic table have 2 outer electrons in their shell. This makes them super reactive with nonmetals that need electrons to feel stable. When they react, they create something called a salt. You can often find them alone in nature, and they can even conduct electricity! The elements are beryllium, magnesium, calcium, strontium, barium, and radium.

**Post-Transition (or other Metals)**— Elements directly to the right of the transition metals. They are known as "poor metals: and are soft and brittle. These include aluminum, gallium, indium, tin, thallium, lead, bismuth, zinc, cadmium and mercury.

**Transition Metal**—The main metals are found in the middle and bottom rows of the periodic table. They look like metal, can conduct electricity, can bend and be shaped easily. The period 4 transition metals are scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, and zinc. The period 5 transition metals are yttrium, zirconium, niobium, molybdenum, technetium, ruthenium, rhodium, palladium, silver, and cadmium. The period 6 transition metals are lanthanum, hafnium, tantalum, tungsten, rhenium, osmium, iridium, platinum, gold, and mercury. The period 7 transition metals are the naturally-occurring actinium, and the artificially produced elements rutherfordium, dubnium, seaborgium, bohrium, hassium, meitnerium, darmstadtium, and roentgenium.

**Metalloids**—The elements called metalloids are a mix of metals and nonmetals. They look like metals, but can't conduct electricity very well. They also break easily and act like nonmetals. These include boron, silicon, germanium, arsenic, antimony, tellurium, astatine, and polonium.

**Non-Metals**—These elements reside in columns 15-17, and can be gases, liquids, or solids. They don't conduct heat or electricity. The solids are brittle, and they have no metallic luster. They readily accept electrons from metals to form salts. These include nitrogen, oxygen, fluorine, chlorine, bromine, and iodine.

**Halogens**—Halogen chemicals are a special type of element. When they mix with metal, they become a kind of salt. Halogens are super reactive because they like to take an electron from metals. They can be found in column 17 of the element table. Some of them can be found in nature, but most are very dangerous and can hurt you if you touch them. They include fluorine, chlorine, bromine, iodine, and the radioactive elements astatine and tennessine.

**Noble Gases**—These elements reside in column 8. They are all odorless, colorless gases that are chemically very stable (inert). They don't generally form compounds by bonding with another element. These include helium, neon, argon, krypton, xenon, and radon.

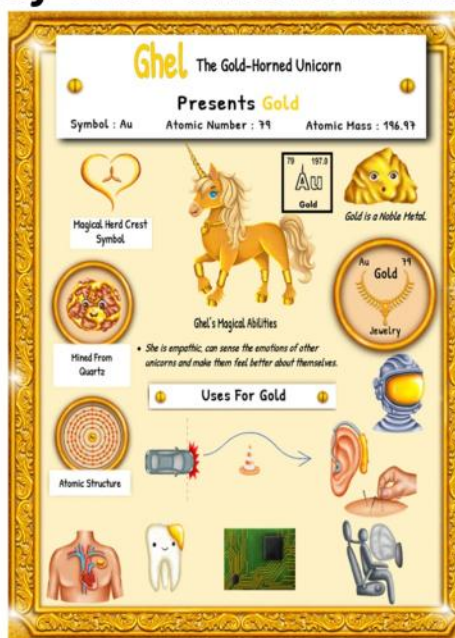
**Lanthanide Rare Earth Minerals**—The Japanese call them "the seeds of technology." The US Department of Energy calls them "technology metals." These elements have atomic numbers 57-71. They are vital to industry. They can be added to metals to strengthen them to make alloys such as stainless steel, used to refine crude oil, and are crucial in producing technology—electronics, telecommunications, and metal devices to name a few. They are lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium,

**Actinide Metals**—Any of a series of chemically similar metallic elements with atomic numbers ranging from 89 (actinium) to 103 (lawrencium). All of these elements are radioactive, and two of the elements, uranium and plutonium, are used to generate nuclear energy. The lanthanides and actinides are sometimes called the inner transition metals, referring to their properties and position on the table. They are actinium, thorium, protactinium, uranium, neptunium, plutonium,

**Super Heavy—Radioactive**—Superheavy elements are those elements with a large number of protons in their nucleus. Elements with more than 92 protons are unstable; they decay to lighter nuclei with a characteristic half-life. They do not occur in large quantities (if at all) naturally on earth, and only exist briefly under highly controlled circumstances. They include lawrencium, rutherfordium, dubnium, seaborgium, bohrium, hassium, meitnerium, darmstadtium, roentgenium, copernicium, nihonium, flerovium, moscovium, livermorium, tennessine, and oganesson.

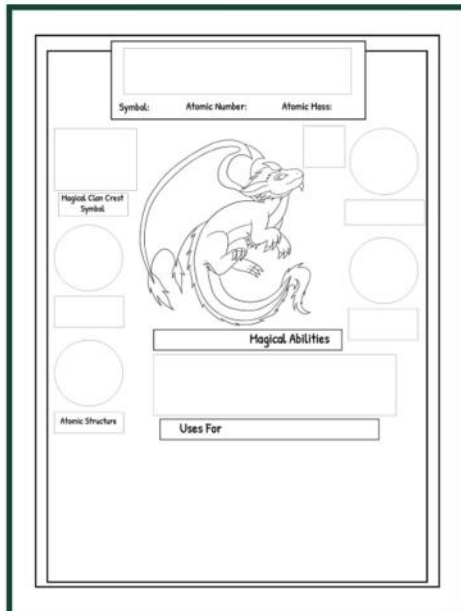


## ***Fun Way For Students To Learn The Elements Of The Periodic Table***



Who discovered this Element?

## Blank Research Sheet



### Interesting and Fun Facts:

## Blank Research Sheet

Get These Fun Elemental Periodic Table Activity Sheets at *MagicalPTElements.com*



# I hope you enjoyed this sample



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