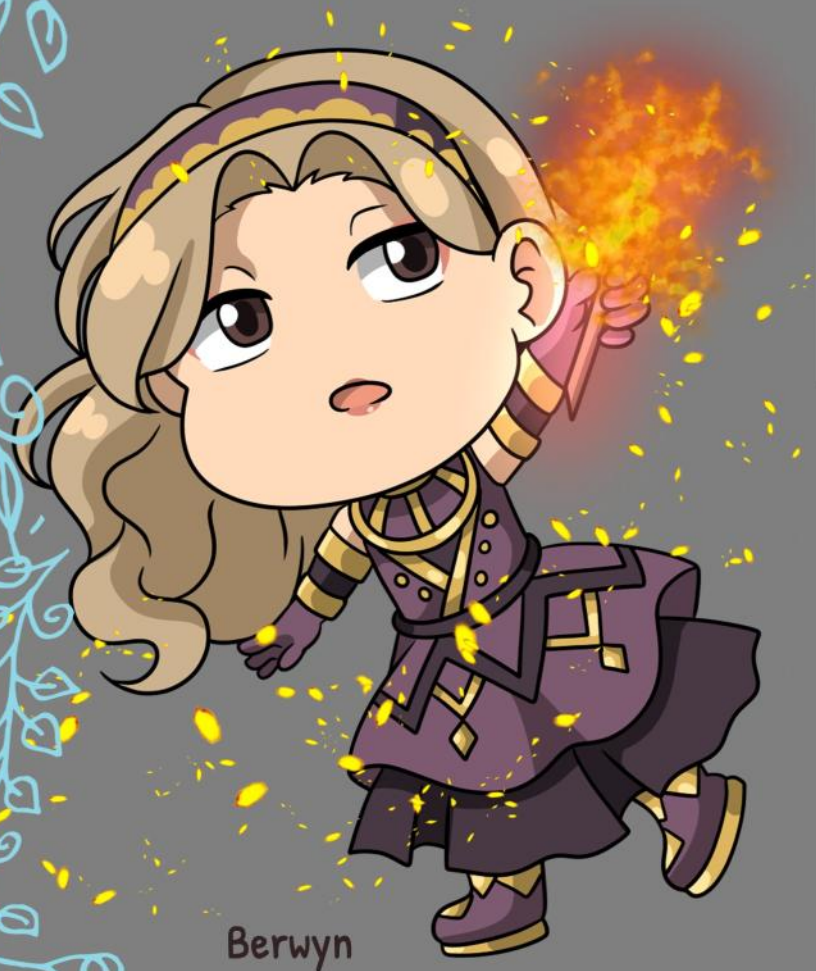
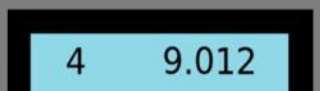
Magical Elements of Magic

Element 4

Beryllium, Presented By Berwyn From The Magical Elements of the Periodic Table Book Series



Berwyn



Beryllium

By Sybrina Durant with Illustrations by Pranavva et al.

Berwyn Presents Beryllium

This Element 4 book features the periodic table element, Beryllium. It is presented by Berwyn, an Alchemical Wizard who wields a magical elemental staff with powers based on its periodic table element.

Berwyn is just one of the 118 elementals who will present all of the Magical Elements of the Periodic Table to readers who are curious about the wonders of the world.

Selenice introduces the very magical element, Selinium, in her book.

The Alchemical Wizards and their other techno-magical friends are the perfect group to introduce you to the elements in the Periodic Table. Hopefully, this Magical Elements of the periodic table book will 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.

Each 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 118 elements presented by fanciful characters like unicorns, dragons, wizards, knights and goblins.. They want you to remember that if there's no metal...there's no magic or technology.

Remember, "No metal - No Magic. . .and No Technology".

It's Techo-Magical.

Note: Sybrina Publishing websites are Sybrina.com and MagicalPTElements.com. Follow sybrinapublishing on Instagram, Magical Elements of the Periodic Table on Facebook, @sybrinad on Pinterest, Sybrina_SPT on Twitter; and Sybrina Durant on LinkedIn.

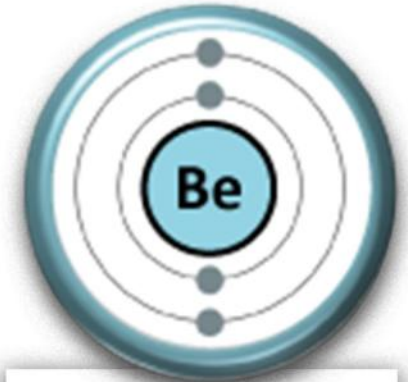
Beryllium is an Alkali Earth Metal

- Beryllium was found as an oxide in 1798 in Paris, France, by the French chemist Nicolas-Louis Vauquelin. He discovered the new element in beryl and emerald gemstones. At first, he called it "glucinium" because its compounds tasted sweet. Later, it was officially named beryllium. Pure metallic beryllium was isolated in 1828 by Friedrich Wöhler and Antoine Bussy.
- Beryllium is a steel-gray metal that is hard, light, and brittle. It is an alkaline earth metal and is known for being very strong for its weight—it is lighter than aluminum and stiffer than steel.
- Beryllium conducts heat very well and stays stable in shape even at very high or very low temperatures. It is often used in aerospace, defense, and advanced electronic parts.
- Beryllium is not magnetic and is known for being very strong for its light weight.
- Beryllium is hard (not ductile) and breaks easily at room temperature, so it is difficult to shape without cracking. But when it gets hotter, it becomes (malleable) and much easier to bend and mold.
- Beryllium is seen as a different kind of Alkaline Earth Metal. Unlike the other Group 2 metals, such as magnesium and calcium, which make strongly basic oxides, beryllium makes an amphoteric oxide (a substance, such as a metal oxide, hydroxide, or amino acid, capable of reacting chemically as either an acid or a base, depending on its

LEGEND

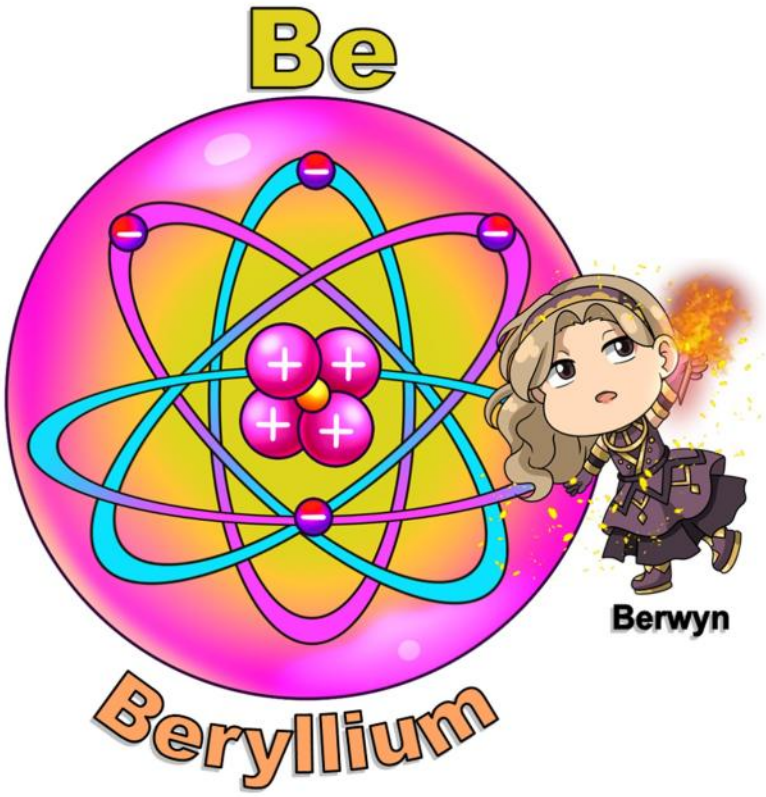
- Alkali Metals
- Alkali Earth Metals
- Transition Metals
- Post-Transition (or Other Metals)
- Metalloids
- Non-Metals
- Halogens
- Noble Gases
- Rare Earth Lanthanide Metals
- Actinide Metals
- Super Heavy—Radioactive

Barium Element



Atomic Structure

Alkali Earth Metals—The elements in column 2 of the periodic table have 2 outer electrons in their shell. This makes them very active with nonmetals that need electrons to stay stable. When they react, they make something called a salt. They are often found in nature all by themselves, and they can even conduct electricity. The elements are beryllium, magnesium, calcium, strontium, barium, and radium.



Beryllium, with the symbol Be and atomic number 4, has an interesting history that reaches from ancient times to modern high-tech work. Long ago, people did not use beryllium as a pure metal the way we do now. Instead, they used minerals that contained beryllium, such as beryl and emerald. Around 2500 BCE, there is evidence that Egyptian craftspeople and other ancient groups worked with these minerals to make colorful glass beads, gems, and decorative items. These materials were valued because they could add beauty, shine, and color to jewelry and art objects. In old glass and glaze work, the minerals themselves were more important than the metal inside them.

In many cultures, minerals and metals were also given special meaning. People sometimes believed they could protect health or bring healing. In traditional Chinese culture and other old medical systems, some minerals were used in remedies or as charms. These uses were not based on modern science, but they show how people tried to make sense of nature and use it for good luck, balance, or healing.

As knowledge of metals grew, workers and makers became interested in materials that were strong but also light. Beryllium itself was not widely used in ancient metallurgy, but the minerals that contained it helped later scientists and metalworkers think about new kinds of materials. This search for lighter and stronger substances eventually led to modern uses of beryllium.

Today, beryllium is important in aerospace, defense, electronics, and nuclear technology. One of its most useful qualities is that it is very light but also very stiff. This means it can help make parts that are strong without adding much weight. Because of this, it is used in satellite frames, aircraft parts, engine pieces, brackets, fasteners, and other precision components. Even small amounts can make alloys much better for these jobs. Beryllium-copper alloys are especially useful because they are strong, hard, and do not spark easily. This makes them good for tools, electrical contacts, springs, and equipment used in defense and industry.

Uses For Beryllium

Beryllium is used in airplanes, spacecraft, and satellites for parts that need to be strong but also very light. Its low weight helps reduce the total mass of the vehicle, which can improve performance and save fuel. Because it is strong and durable, it is useful for important structural parts that must handle stress and harsh conditions.

Beryllium is a useful metal that helps make parts for satellites and communication devices. It is used because it is light, strong, and can work well in space. These parts must be able to handle tough conditions, so beryllium is a good choice. In telecommunications satellites, it may be found in different components that help send and receive signals. It is also used in other devices that need materials that are strong but not too heavy. Beryllium plays an important role in making modern communication technology work well.

The Source of Beryllium

Beryl is a key mineral that has Beryllium in it. It is mostly found in volcanic rocks. The U.S. is is the largest producer of Beryllium, holding about 60% of the world's supply!

Beryllium begins its journey far below the Earth's surface, hidden inside solid rock. It is not a metal that people usually find lying around in pure form. Instead, it is locked inside minerals such as beryl and bertrandite. Some forms of beryl are even more famous by their gemstone names, like emerald and aquamarine. Because beryllium is uncommon, extracting it takes time, effort, and careful work.

The process begins with mining. Workers search for and remove rocks that contain beryllium-bearing minerals from places where those minerals occur naturally. Large deposits can be found in countries such as the United States, China, and Brazil. Mining can happen in open pits or underground, depending on where the ore is located and how deep it lies. Once the rock is brought to the surface, it is not yet useful on its own. It must first be broken down into much smaller pieces. Workers crush the rock and then grind it into a fine powder. This step is important because smaller pieces make it easier to separate the valuable beryllium from the unwanted material around it.

After the rock is crushed and ground, the chemical processing begins. This is one of the most important and delicate stages in the entire journey. The powder is heated and mixed with chemicals, often including sulfuric

- The James Webb Space Telescope features a remarkable beryllium primary mirror composed of 18 hexagonal segments. Together, these segments form a single, giant reflecting surface that measures 6.5 meters, or 21 feet 4 inches, across. Each individual piece weighs about 46 pounds, yet they must be positioned with extreme precision to work together seamlessly. Once aligned, the segments behave like one large concave mirror, gathering and focusing faint light from distant objects in space. This innovative design allows Webb to observe some of the oldest and most distant galaxies ever detected.
- In the 1960s, a beryllium heat shield played a crucial role in protecting NASA's Mercury capsule and the astronaut inside during the first manned journey into space. As the spacecraft reentered Earth's atmosphere, intense friction created extreme heat that threatened both the capsule and its occupant. The beryllium shield absorbed and managed this heat, helping the Mercury mission succeed safely. Its use marked an important achievement in early space exploration, demonstrating how advanced materials could make human spaceflight possible. This innovation helped pave the way for later missions and proved vital to the success of America's first steps into space.

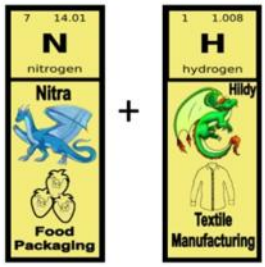
Polyatomic Ions

While individual elements are typically not polyatomic, certain elements can form polyatomic molecules or ions. Many polyatomic ions exist, formed by groups of atoms covalently bonded together with an overall charge. Polyatomic ions carry a net electric charge, either positive (cation +) or negative (anion -). Despite being made of multiple atoms, polyatomic ions behave as a single, distinct entity in chemical reactions and compounds.

Ammonium =

(NH4+)

Contains one nitrogen and four hydrogen atoms.

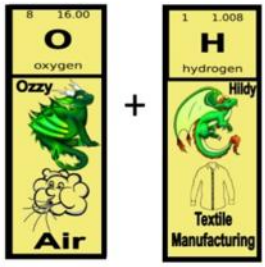


Ammonium is widely used in agriculture as a fertilizer and in industrial applications for cleaning, refrigeration, and chemical manufacturing.

Hydroxide =

(OH-)

Contains one oxygen and one hydrogen atom.

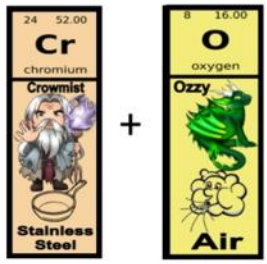


Hydroxide is commonly used for cleaning, paper production, water treatment, food processing, and as a component in pharmaceuticals and various industrial processes

Chromate =

(CrO4 -2)

Contains one chromium and four oxygen atoms.



Chromate is commonly used for corrosion prevention on metals, as a pigment in paints and dyes, and in leather tanning. It also finds applications in cement and mortar, and as a corrosion inhibitor in cooling water systems.

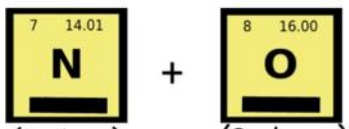
Sulfate =

(SO4 2-)

Contains one sulfur and four oxygen atoms.

Sulfates are found in detergents, shampoos, and other cleaning products as surfactants, which help create lather and remove dirt and oil. Additionally, sulfates are used in agriculture, medicine, and industrial processes.

Can you guess the most commonly used polyatomic ion?



= ??????

The above chart only shows a few of the polyatomic ions formed by those elements. There is no known fixed finite number of polyatomic ions but some other important ones are:

Carbonate (CO3 2-): Crucial in construction, medicine, agriculture, and food production. **Phosphate (PO4 3-):** Most notably used in fertilizers to enhance plant growth, in animal feed supplements, and in cleaning products. **Acetate (CH3COO-):** Used in the preparation of metal acetates, used in some printing processes; vinyl acetate, employed in the production of plastics; cellulose acetate, used in making photographic films and textiles.

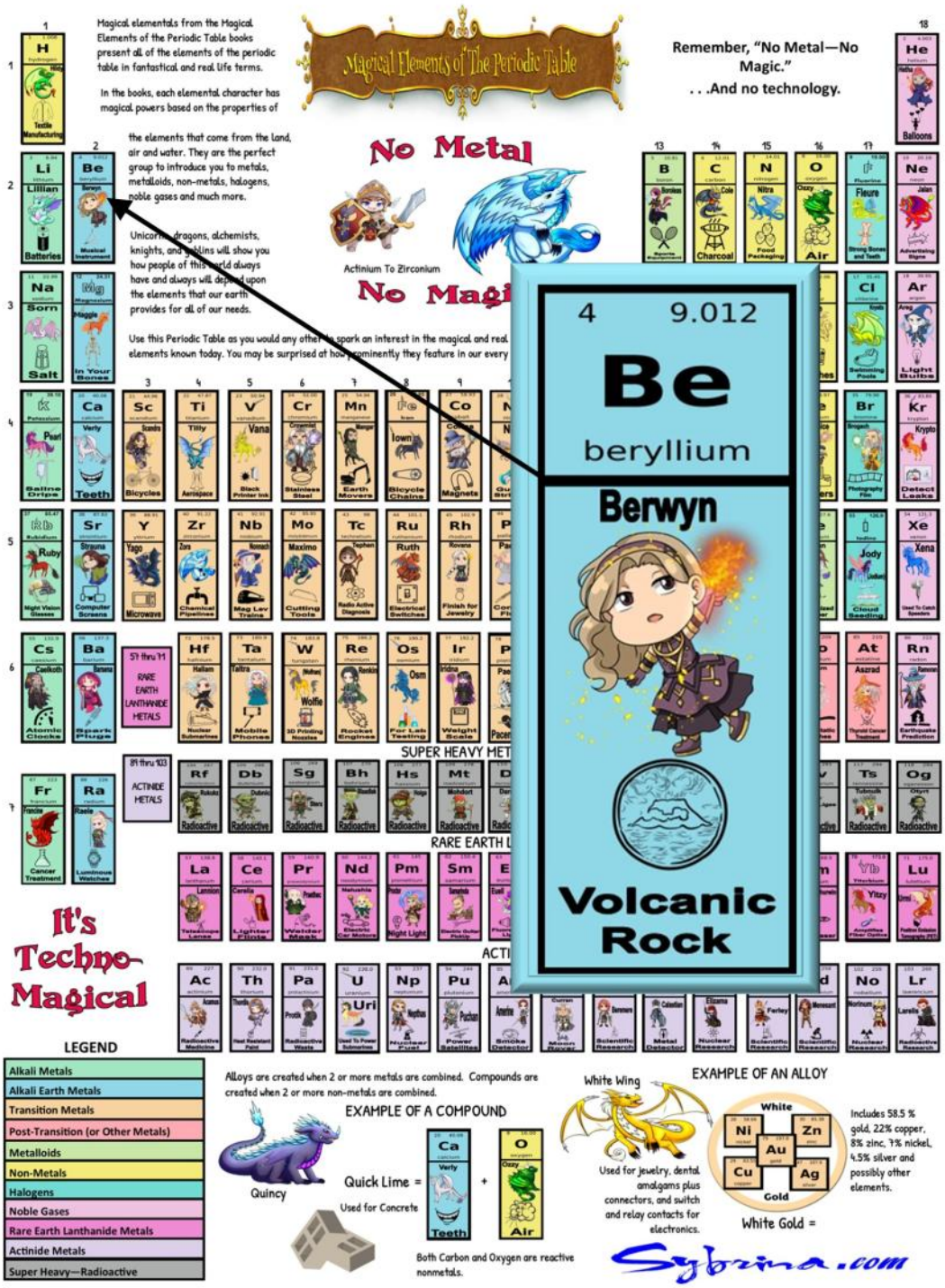
The most commonly used Polyatomic Ion is ***Nitrate (NO3-)*** : Primarily used in medicine, food preservation, and as fertilizers .

Berwyn The Wizard With The Beryllium Staff

Symbol: Be Atomic Number: 4 Atomic Mass: 9.012

Berwyn resides in Group 2 Period 2 on the Periodic Table.

The atomic symbol is Be. It's Atomic Number is 4. It's Atomic Mass is 9.012.



Meet Berwyn, The Wizard With The Berillium Tipped Staff

Mist hung low over Thornwood Ravine as Berwyn stood at the broken edge of the Bridge of Varathen. Her dark purple dress moved in the cold wind. Gold lines shimmered on her sleeves, and her long blonde hair blew behind her like bright silk. In her hand, she held her Beryllium Staff — smooth, silver-white, with golden light running through it, and a quiet hum of power.

The center part of the bridge had fallen into the wild black river far below. Across the gap, a fortress sat in shadow, holding the one thing that could destroy civilization as they knew it — the Varathen Codex. "Inconvenient," Berwyn said.

"Inconvenient?" said a voice from her left. Corvin Ashdale, a tall, thin inventor with copper-tinted goggles and a leather coat full of tools, stepped away from a mossy rock. "I'd say catastrophic. Maybe deadly. Those are better words."

"Only for people who panic," she said calmly. "You may want to work on that."

Before Corvin could answer, there was a rustling in the trees. Berwyn lifted her free hand in a smooth, dance-like motion. Gold sparks lit up on her gloved fingers as a shining shield appeared between them and the woods. A young woman stumbled out, holding up her hands, eyes wide. She had messy auburn hair, a muddy cloak, and a crossbow on her back.

"Easy! I'm not with Malachar!" she said, out of breath. "My name is Piper Dawnhollow. I'm a messenger from the Alchemical Council. I've been running through this forest for three days to find you." She stared at the glowing shield. "Please don't turn me into goo."

"Force fields don't turn people into goo," Berwyn said kindly, lowering her hand. The shield vanished in a shower of gold sparks. "They squeeze them a little. Sometimes."

Piper blinked. "That is not better."

Corvin smiled. "Oh, I like her."

Piper gave her message quickly. Malachar had the Codex and two pages of the Primus Formula. Together, they could ruin every alchemical compound within five hundred miles at midnight. Buildings would fall apart, medicines would stop working, and everything would descend into chaos. "Then we move now," Berwyn said, turning back to the broken bridge.

"It's destroyed," Piper said carefully.

"I know." Berwyn closed her eyes and pressed the Beryllium Staff to the stone edge. The golden light in it flared, climbing up her gloves and spreading across the gold parts of her dress like fire on oil. She held the staff out in front of her and silently worked through alchemical formulas.

The broken stones shook — then lifted.

Pieces of old stone rose from the ruined arch, turning slowly and fitting together like puzzle pieces. Berwyn moved through the work with careful precision, making the bonds in each stone stronger and tighter. In a deep clang that echoed through the ravine, the bridge came back together — whole, strong, and ready to hold.

Piper jumped on it a little and smiled. "It doesn't even bend."

"Beryllium-reinforced stone does not bend," Berwyn said, already walking. "That's the point."

The fortress gates were thirty feet tall, made of black iron and carved with marks of the Unraveling

Enjoy This Coloring Page Featuring Berwyn

The Alchemical Wizard With The Beryllium Tipped Staff

Magical Elements of The Periodic Table

Create Your Own Magical Wizard Elemental

Berwyn The Wizard With The Beryllium Staff

Symbol: Be Atomic Number: 4 Atomic Mass: 9.012

Magical Elemental Symbol

4 9.012
Be
beryllium

Beryllium is an Alkaline Earth Metal

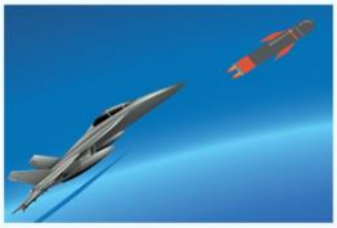
Extracted From Beryl

Berwyn's Magical Abilities

Berwyn can create invisible force fields to protect herself, or use them to cast spells and make sparks of electricity in a room.

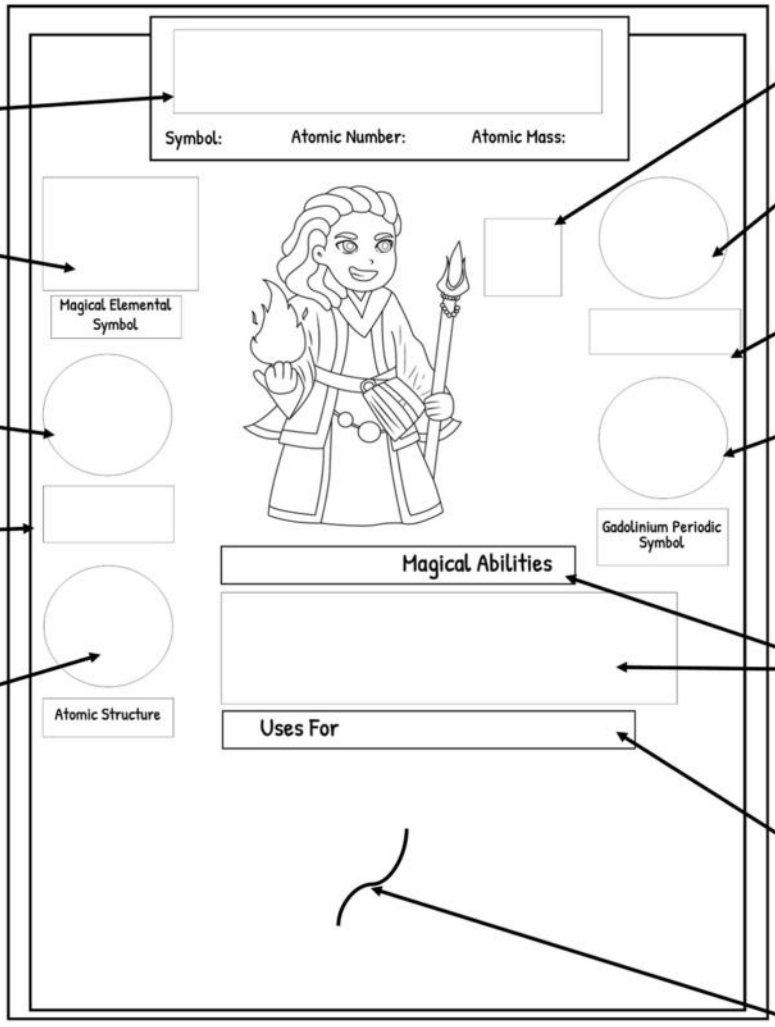
Beryllium Periodic Symbol

Atomic Structure



Magical Elements of The Periodic Table

Students may either use a program like power point to cut and paste clip art into a Magical Wizard Elemental Blank or, if they wish, they may draw everything themselves.



Place your dragon name and related element here

Draw a Magical ClanCrest Symbol. Represent the elemental magic.

Show a cute cartoon picture of the element.

List the element type here. Ie: Rare Earth, Halogen, Etc.

Show the number of electrons in the atomic structure

Design a border that represents the element properties.

Draw the periodic Symbol for this Element

Draw a cute cartoon picture representing ore or other source of extraction

List what this element is mined or extracted From

Create a tag containing the element symbol, atomic number, name of element plus a picture of a use for the element.

Personalize this Magical Elemental Dragon List 1 or 2 of their magical abilities that are based on the properties of the element.

Show element Name

Draw or place clip art pictures here representing use of element

Magical Wizard Elemental Research Sheet

Before starting your Magical Wizard Elemental graphics page, do some research on your chosen element.

Name of Magical Wizard:	
Wizards's Magic Power Based on the Element's Properties:	
Magical Elemental Symbol:	
Element Name:	
Element Symbol:	
Atomic Number:	
Atomic Mass:	
What year and where was this Element discovered?	
Who discovered this Element?	
Element Group:	
Element Period:	
Element Family Name:	
State of Element At Room Temperature:	
What is Element Mined or Extracted From?	
Is Element Magnetic?	
Does Element Conduct Electricity?	
Where is the Element commonly found in Nature?	
What is 1 alloy of the Element? How used?	
What is 1 compound of the Element? How used?	
Name the most common use for this Element:	
Name a little known use for this Element:	
Name one more use for this Element:	
Interesting and Fun Facts:	

Write a paragraph below to describe your magical wizard elemental. Based on the information obtained from research of your chosen element, how did you determine your wizard's name? What are your wizard's magic powers? What are their likes/dislikes, strengths/weaknesses, personality traits? What color are your wizards clothes and why did you pick that color? What is your wizard's Magical Elemental Symbol?

I hope you enjoyed this sample

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Learn more about it at magicalptelements.com

Sybrina Publishing

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please spread the word to teachers,

home schoolers and anyone else who might enjoy it.