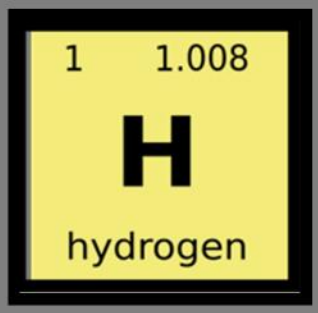
Magical Periodic Table Magic

Element 1

Hydrogen, Presented By Hildy, From The Magical Elements of the Periodic Table Book Series



Hydrogen

By Sybrina Durant with Illustrations by Pranavva et al.

Hildy Presents Hydrogen

This Element 1 book features the periodic table element, Hydrogen. It is presented by Hildy, a member of the Elemental Dragon Clan. Each dragon has a magical tail tipped with an element that gives them unique powers. Their powers are based on the properties of their element.

Hildy 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.

Hildy introduces the very magical element, Hydrogen, in her book.

The Elemental Dragon Clan and their other techno-magical friends are the perfect group to introduce you to metals and other elements in the Periodic Table. Hopefully, this Magical Element of the 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 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.

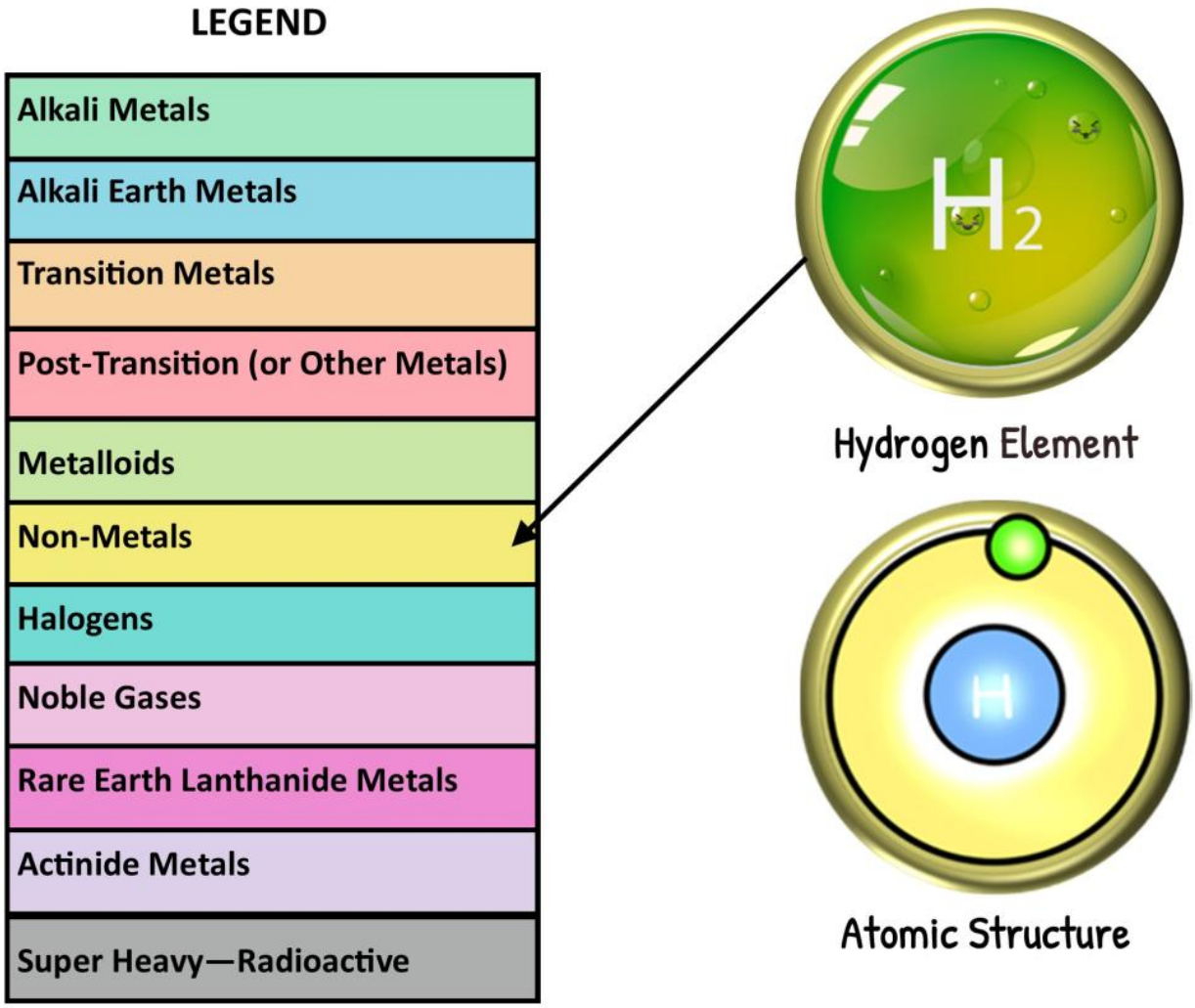
Remember, "No metal - No Magic. . .and No Technology".

It's Techo-Magical.

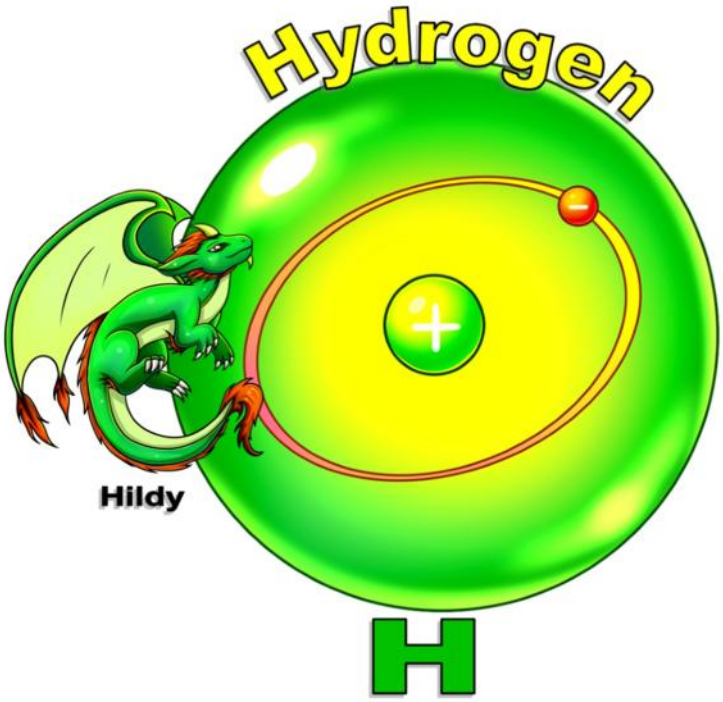
Note: Sybrina Publishing websites are Sybrina.com and MagicalPTElements.com. Follow sybrinapublishing on Instagram, Magical Elements of the Periodic Table on Facebook, @sybrinad on Pinterest, Sybrina_SPT on Twitter; and Sybrina Durant on LinkedIn.

Hydrogen is a Non-Metal

- In the 1500s, Paracelsus observed bubbles from iron and sulfuric acid mixtures in the mining districts of Austria but didn't identify it as a new substance. In 1671, Robert Boyle produced hydrogen by mixing iron filings with dilute acids. Later, in 1766, Henry Cavendish recognized it as a distinct element, calling it "inflammable air."
- Hydrogen is the lightest gas and element. It is about 14 times lighter than air, so it rises easily. It is a diatomic gas with no color or smell, and it can catch fire easily.
- Hydrogen gas does not carry heat or electricity well because it is a non-metal and has no free charged particles. In this form, it acts like an insulator.
- Hydrogen is very weakly diamagnetic, meaning it is weakly repelled by magnetic fields.
- Hydrogen is classified as a Non-Metal, not a noble gas, because it has only 1 electron in its outer shell and needs 1 more to fill it. Noble gases already have full outer shells. Hydrogen is a reactive gas that exists as two atoms joined together. It makes covalent bonds, does not conduct electricity well, and has a high ionization energy. These are all traits shared by non-metals.



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.



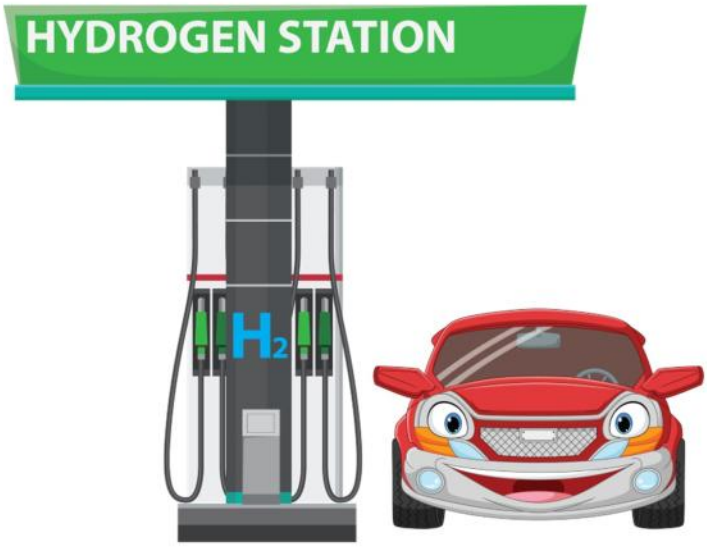
Hydrogen is the lightest element and one of the most common elements in the universe. People have been interested in it for a long time because it can burn easily and it is very light. Since it was first discovered in the 1500s, hydrogen has been used in several different ways. Some of these early uses were important at the time, but over the years hydrogen was mostly replaced by safer, cheaper, or easier options.

One of the first names for hydrogen was "inflammable air." In 1766, the British scientist Henry Cavendish separated it and found that it burned very easily. This made people curious about it, and they began testing how it could be used. One early use was for balloon flight. Because hydrogen is so light, it could help balloons rise into the air. In 1783, the Montgolfier brothers used hydrogen in the first successful manned balloon flight, and this opened the door to early air travel experiments.

Hydrogen was also used for lighting in the 1800s. It was put into gas lamps because it gave off a bright flame. At the time, this was useful because it was cleaner than candles or oil lamps. Later, hydrogen was used in welding and cutting metal. Oxy-hydrogen torches could create very high heat, which made them useful in some factory and metalworking jobs. Hydrogen was also used in airships during the early 1900s because it could lift them into the sky. But this use became far less common after the Hindenburg disaster in 1937, when a hydrogen-filled airship caught fire and crashed. After that, many people became afraid of hydrogen, and safer gases like helium were used instead.

Hydrogen is not widely used for these old purposes today for several reasons. One big reason is safety. Hydrogen can catch fire very easily, and the Hindenburg crash showed how dangerous it can be if it is not handled carefully. Another reason is that other choices have become better. Electric lights replaced gas lighting because they were safer, brighter, and easier to use. Other fuels like acetylene and propane replaced hydrogen in welding because they were more practical in many work settings. Hydrogen is also hard to store and transport because it is a very light gas and takes up a lot of space unless it is compressed or made very cold, which adds cost and complexity.

Uses For Hydrogen



Hydrogen is used to power vehicles in some countries. It can be turned into energy that helps cars, buses, and trucks move. Some people like hydrogen because it makes less pollution than gas or diesel. It can also be filled into vehicles fairly quickly. However, not many places have enough stations for it yet. In some countries, hydrogen is seen as a clean fuel for the future and a possible way to reduce harm to the environment.

Hydrogen is used in hydrocracking, a process that helps turn heavy refinery products, like crude oil, into more useful fuels and chemicals. In this process, the large molecules are broken, or "cracked," into smaller ones. This makes products such as gasoline and diesel. It also helps create many other important chemicals used in everyday life. Hydrocracking is a useful way to get more value from heavy oil materials.

The Source of Hydrogen

Green Hydrogen is produced by using electricity to split water molecules (H2O) into hydrogen (H2) and oxygen (O2). Blue hydrogen is produced from hydrocarbon sources, such as natural gas, and combined with carbon capture technology.

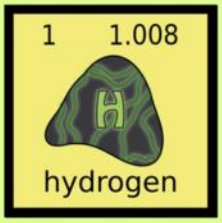
Hydrogen is the lightest and most common element in the universe. It is used in energy, transport, factories, and science. More people are talking about hydrogen now because many countries want cleaner energy. But one question is very important: where does hydrogen come from?

The short answer is that hydrogen is not usually found alone in nature. Most of the time, it is joined with other elements. For example, it is found in water, which is made of hydrogen and oxygen. It is also found in fuels like natural gas, oil, and coal. So, before people can use hydrogen, they must separate it from these other materials.

One of the main ways to make hydrogen is called steam methane reforming, or SMR. This is used in many countries. In this process, natural gas is mixed with very hot steam. The heat causes a chemical change that creates hydrogen and carbon dioxide. This method is popular because it can make a lot of hydrogen and it is cheaper than some other methods. The problem is that it also makes carbon dioxide, which is a gas that adds to climate change.

Natural gas comes from deep underground. It is a fossil fuel that formed millions of years ago from dead plants and animals buried under rock and soil. People get it by drilling into the ground. After it is brought up, it can be used for heating, cooking, making electricity, or making hydrogen. Because it is easy to use and move, it is one of the main sources for hydrogen production.

Hildy Presents Hydrogen



Did You Know?

Hydrogen is used to turn unsaturated fats into saturated oils and fats through hydrogenation. Hydrogen is used to make hydrogenated vegetable oils in foods such as margarine, peanut butter, and it is even in some skin care products.

- Henry Cavendish studied hydrogen gas from 1766 to 1781. He was the first person to discover that when hydrogen burns, it makes water. This was an important scientific finding. Because of this, hydrogen got its name from the Greek word "hydrogen," which means "water-former."
- Hydrogen is often given colors to show how it is made. There is green, blue, grey, black, brown, pink, turquoise, yellow, and white hydrogen. Green hydrogen is seen as the cleanest because it is made using renewable energy, like wind or solar power. Black hydrogen is the most harmful to the environment because it is made from coal and creates a lot of pollution. The other colors show different ways hydrogen can be produced, and each one has a different level of impact on the planet. These color names help people understand which types are cleaner and which are dirtier.
- Hydrogen is different from the noble gases because it has only one electron in its outer shell. This makes it less stable and more ready to react. Noble gases already have full outer shells, so they do not usually join with other substances. When hydrogen gas is activated by heat, light, or other energy, it can react very quickly and give off heat. Hydrogen can also combine with oxygen and some other active gases. When it reacts with oxygen, it forms water vapor, which is harmless.
- Hydrogen, once called "inflammable air," became a key part of the great chemical changes of the late 1700s. Studying it helped scientists break an old idea: that water was a basic element. This pushed chemistry toward a new way of thinking, based on careful measurements and facts.

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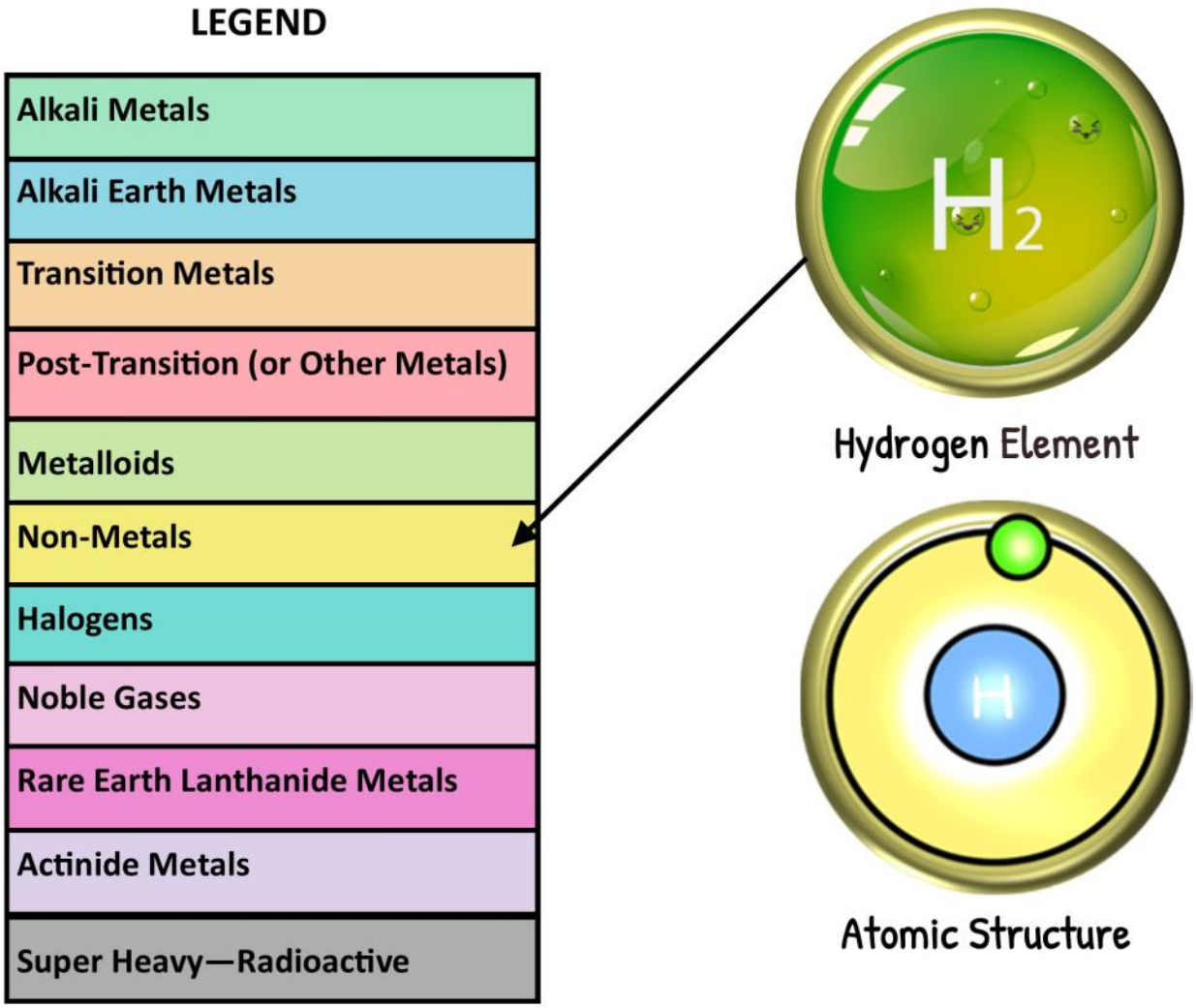

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Meet Hildy, The Dragon with a Magical Tail Tipped with Hydrogen

Hildy the elemental dragon woke to a MarBryn sunrise painted in copper and jade, her consciousness blooming like a flower unfurling toward warmth. Her skin gleamed a vibrant green, a friendly brightness that hinted at mischief and warmth. A pale lime underbelly matched the light-green membrane of her enormous wings, which stretched like sails above a coiled, orange-furred tail that twitched with anticipation. Her orange mane sparked with energy, crackling softly as morning dew evaporated against her scales, and a playful glint lit her amber eyes as she tested the air for adventure.

She carried a rare gift: the ability to manipulate hydrogen in all its knowing forms. Hydrogen wasn't just air to her—it was an ember that could be coaxed into shape, a mist she could condense, a fusion flame she could tame. She had spent centuries learning this art, studying the invisible dance of atoms, understanding the language that elements spoke to those patient enough to listen.

A quick-witted sprite named Brin flew near her shoulder in a swirl of emerald light, humming a tune that seemed to make the morning brighter. Brin's tiny wings buzzed with curiosity, and he spoke in spark-crackling riddles. Their bond was a study in balance: Hildy's power could ignite the night, while Brin's clever schemes kept them witty, humble, and prepared. They had been companions for three seasons now, ever since Brin had appeared in her cave during a storm, soaked and shivering, speaking in riddles even as his teeth chattered.

"Good morning, captain," Brin chirped, his voice like wind chimes in a gentle breeze. "I dreamed of storms last night. Dark ones. The kind that don't belong."

Hildy's expression grew serious. She had sensed it too—a disturbance in the hydrogen flows, a wrongness in the air currents. "The Smokewraith Caverns," she murmured.

Their enemy emerged from the Smokewraith Caverns that very afternoon: Malvar, a powerful apprentice to the most evil sorcerer, Magh, the scourge of MarBryn. Malvar believed hydrogen belonged to the dark arts and should be hoarded by those with the will to dominate. He wove dangerous currents of gas with twisted intent, threatening towns with fizzing storms and blistering heat that left scorch marks on the earth. Malvar sought to weaponize hydrogen fusion to become a master of combustion, to reshape the world according to his vision of power and control. He had already destroyed three villages on the eastern plains, leaving behind only ash and the acrid smell of his ambition.

The first rumor spoke of a flame that wouldn't die, a fire that consumed everything in its path. Hildy leaped from cliff to cliff, her powerful wings propelling her across the landscape, summoning and dispersing hydrogen with precision. She condensed invisible molecules, their droplets swirling around her like a halo, and whispered to them in the ancient language of elements. With a breath, she gathered hydrogen, liquefying it mid-air into a shimmering pool that powered a portable forge Brin could use to craft gear for their journey—lighter armor, stronger tools, better maps marked with safe routes.

She demonstrated hydrogen levitation, lifting herself above jagged rocks to scout ahead, Brin riding the thermals with excited chatter. From high above, they could see the path of destruction Malvar had carved through the land: blackened forests, rivers boiled dry, stone turned to glass by the intensity of his flames.

"He's heading toward Millbrook," Brin observed, pointing with one tiny finger. "The village where the children gather for the harvest festival."

Hildy's jaw tightened. "Then we fly faster."

Enjoy This Coloring Page Featuring

Hildy The Dragon with the Hydrogen Tipped Tail

Sample Page From Magical Elements of the Periodic Table Presented By The Elemental Dragons Book

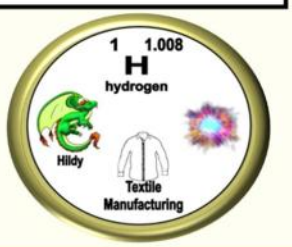
Hildy Presents Hydrogen

Symbol: H Atomic Number: 1 Atomic Mass: 1.008

Hydrogen Facts

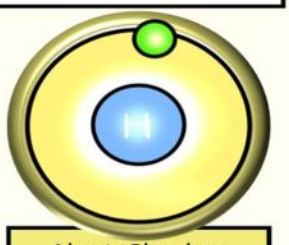
- First artificially produced in the early 16th century
- The lightest gas
- Poor conductor of heat and electricity
- Very weakly magnetic—Diamagnetic
- H2 (molecular Hydrogen) is highly reactive
- Non-Metal Gas

Green Hydrogen is produced by using electricity to split water molecules (H2O) into hydrogen (H2) and oxygen (O2). Blue hydrogen is produced from hydrocarbon sources, such as natural gas, and combined with carbon capture technology.



Hildy's Magical Abilities

- A rainbow blast of energy from Hildy's Hydrogen tipped tail provides super fuel to power vehicles from race cars to space craft.



Atomic Structure

Uses For Hydrogen

Hydrogen is used to fuel vehicles in some countries.

Hydrogen is used in the hydrocracking process which takes heavier refinery products like crude oil and "cracks" the large molecules into smaller ones to make things like gasoline, diesel and thousands of other chemicals.

Next to oil refineries, ammonia is currently the largest application of hydrogen. Ammonia (NH_3) is used to produce ammonium nitrate, a fertilizer, and is part of many household cleaning products. Don't forget to wear your gloves when using it!

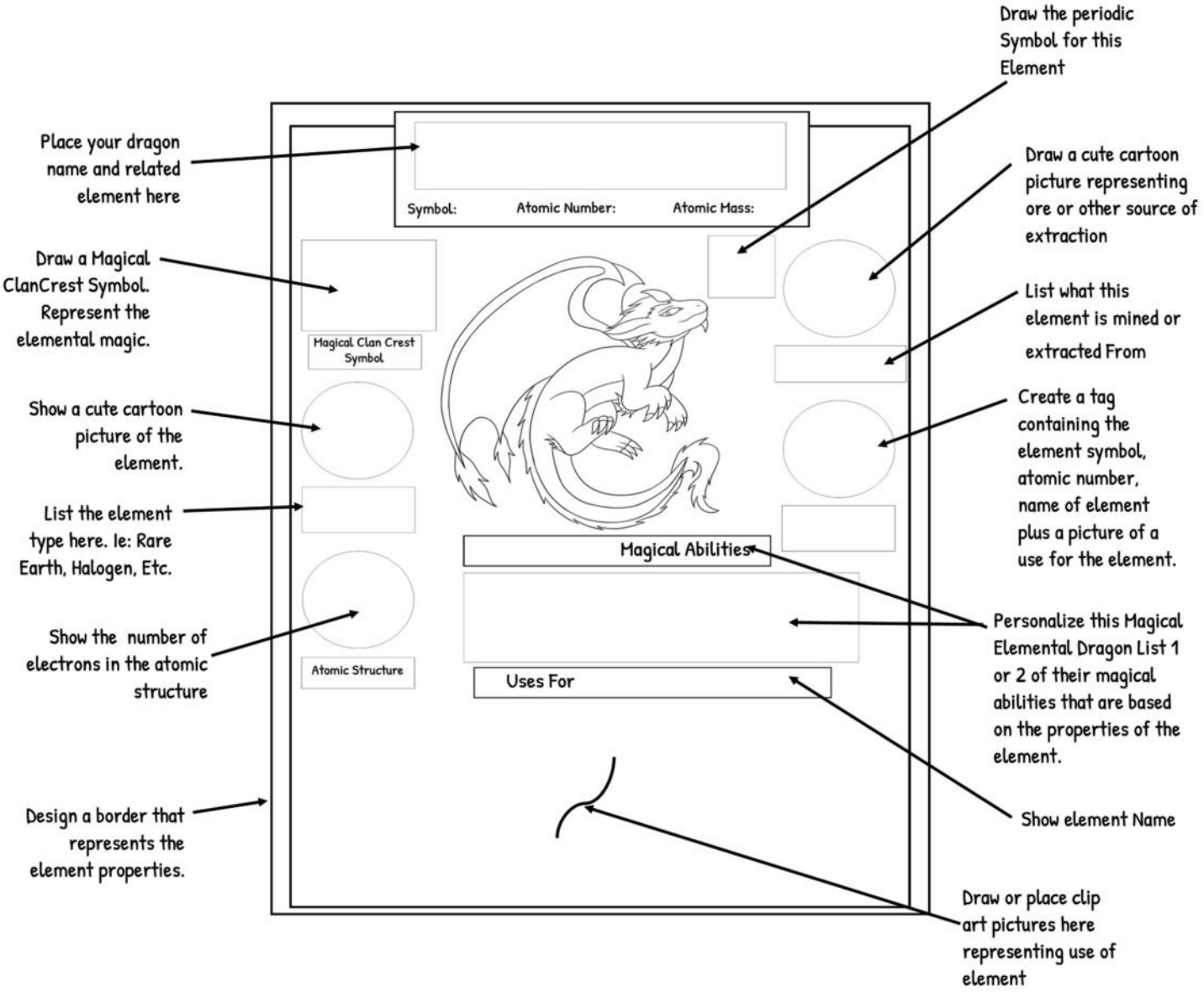
Hydrogen is used to turn unsaturated fats into saturated oils and fats through hydrogenation. Hydrogen is used to make hydrogenated vegetable oils in foods such as margarine, peanut butter, and it is even in some skin care products.

Did You Know?

- Henry Cavendish, during the years 1766–1781, was the first person to find out that hydrogen gas turns into water when it is burned. Because of this, it got its name from the Greek word "hydrogen" which means "water-former".
- Hydrogen is color coded. There's green, blue, grey, black and brown, pink, turquoise, yellow and white. Green is the cleanest and black is the most environmentally damaging.
- Hydrogen is not like the noble gases because it only has one electron in its shell, which makes it unstable. Unlike noble gases that have full outer shells of valence electrons, hydrogen is different. When hydrogen gas gets activated by heat, light, or other things, it reacts very fast and releases heat. It can also combine with oxygen and other reactive gases to form harmless water vapor.

Magical Elements of The Periodic Table

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



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Learn more about it at magicalptelements.com

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If you love the book,

please spread the word to teachers,

home schoolers and anyone else who might enjoy it.