

*I think that modern physics has definitely decided in favour of Plato. In fact, the smallest units of matter are not physical objects in the ordinary sense; they are forms, ideas which can be expressed unambiguously only in mathematical language.*

**Werner Heisenberg**

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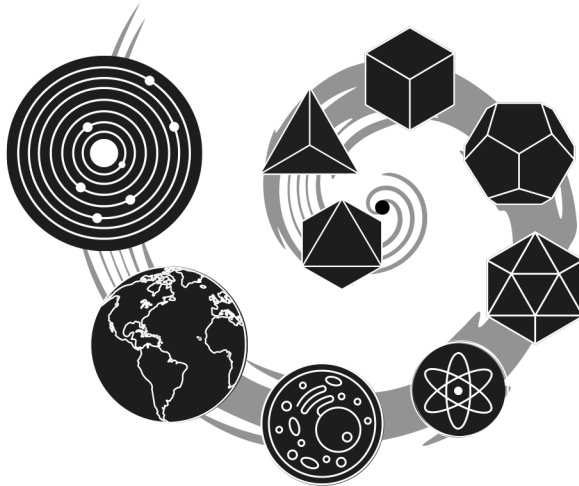
# GEOMETRIC UNIVERSE

Beyond space & time

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Once the form was complete,  
the time for contemplation arrived.



*Then God blessed the seventh day and made it holy.*

**Genesis 2:3**

## Foreword

Across various cultures throughout history, a prevailing belief has emerged that the world we inhabit is intricately intertwined with geometric principles. Whether through nature's mesmerising patterns, cosmology, ancient structures and geometric symbolism, the recognition of geometry's significance transcends time and geographical boundaries, building a mathematical framework of the fundamental aspects of our existence.

In the last 200 years, we have dramatically improved our understanding of the Universe through discoveries such as the electromagnetic spectrum, the structure of the atom, new material sciences, and biological processes. In the field of geometry we have managed to conceptualise polytopes of higher dimensions, and discovered fractal geometry, which has opened the door for a fresh interpretation of the mechanisms that govern our Universe.

In this book, we re-evaluate the wisdom of the ancients within the context of these new discoveries, and update the assumptions of the geometers of the past to formulate a new perspective of the *Geometric Universe*. Central to this is a revision of the 5 Platonic solids and their association to the 5 *Elements*. This generates an updated model, which unifies the wisdom presented by spiritual and religious philosophies with modern science. Through the practical creation of the Platonic solids, nested in the correct scale and order, you will gain a deeper comprehension of the geometric processes at work, from the Universe at large down to the smallest scales of the atom. This provides a key to a doorway of the mind, which helps to unlock the deepest secrets of reality.

*Before, I used to look at the Universe as an infinite void, far beyond my ability to understand. Now, I see it as a relatively simple construct, that I can grasp within my hands.*

**Colin Power**

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# **Part I**

## Introduction

*Whilst immersed in nature, without any internet, and through  
the opening of my eyes, I was finally able to see.*

**Colin Power**

# Nature's Patterns

## Geometric principles around us

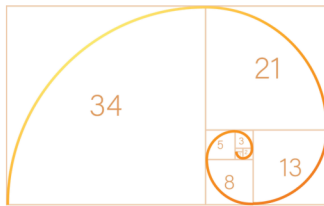
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Whether walking through a park, gardening in your backyard, or scuba diving underwater, what do you notice about the world around you? Many phenomena express fascinating geometric patterns, symmetries, and shapes, underlying the beauty of nature. Each snowflake possesses a unique six-fold radial symmetry, resulting from the molecular arrangement of water molecules as they freeze. This arises from the hexagonal crystal lattice of ice, also prevalent in carbon structures, honeycombs, and even basalt columns, whose angles between the cracks are approximately  $120^\circ$ . Mathematically, the hexagon has been proven to be the most efficient shape to fill space (hexagonal-closed packing).

Nature is often based on self-similar patterns, known as *fractals*. The branching of trees, lightening in a storm, weather patterns, broccoli, pine cones, and pineapples, all express an intricate repeating pattern of self-similar forms at different scales. This principle is embodied within the *Fibonacci sequence* (page 156), where each number is the sum of the two preceding ones. Many flowers and growth patterns adhere to this sequence, with 144 ( $12^2$ ) being the last naturally occurring number, most commonly found within sunflowers. The ratio of neighbouring *Fibonacci numbers* converge towards the *Golden ratio* (Phi), also known as the *Divine proportion*, which is expressed throughout the world, and even the human body (page 150). Many artists such as Leonardo da Vinci and Roman architect Vitruvius have incorporated this principle in their work, as a means for creating harmony and beauty.

These examples demonstrate the prevalence of geometric principles in nature, which seem to optimise efficiency, growth, and survival. Yet, at the same time, it seems to unveil an inherent order, illuminating a deeper relevance to life itself. Many ancient cultures across the globe have tapped into the philosophy of geometry as a mathematical framework, upon which their beliefs have been founded.

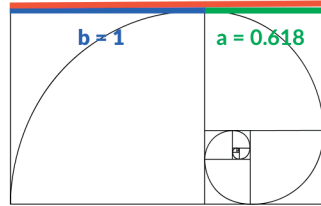
# Nature's Patterns



## Fibonacci sequence

1+1=2, 1+2=3, 2+3=5, 3+5=8  
 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144

$a + b = \text{Phi } (\Phi) \approx 1.618$



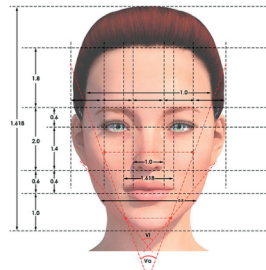
## Golden ratio (Phi/Φ)

$(a+b)/a = a/b$

Fibonacci

$1:1 = 1$   
 $2:1 = 2$   
 $3:2 = 1.5$   
 $5:3 = 1.666666666667...$   
 $8:5 = 1.6$   
 $13:8 = 1.625$   
 $21:13 = 1.61538461538...$   
 $34:21 = 1.61904761905...$   
 $55:34 = 1.61764705882...$   
 $89:55 = 1.61818181818...$   
 $89:144 = 1.61797752808...$

**Φ (Phi) = 1.618033989...**



**Golden ratio in the body**

# Geometric Symbolism

## Sacred Geometry

---

No matter which belief systems you turn to, almost all buildings of worship, such as churches, cathedrals, temples, mosques, stupas, and synagogues embody geometric principles. While this helps to ensure structural integrity, stability, and optimal use of space, it conveys a deeper meaning beyond its architectural design. Geometry is often seen as a reflection of a divine order and harmony in the Universe that interconnects all creation.

According to these beliefs, different aspects of God's plan seem to be expressed through a variety of geometric symbols. The *Fish* stands for Jesus, which is also incorporated in the Chalice Well, in Glastonbury (UK). The *Trinity*, or *Triquetra* has been found particularly in Celtic culture, where it is believed to represent the eternity of life. It was subsequently adopted by Christianity to embody the concept of the *Holy Trinity*, a theme also central to Hinduism. In Islam, figurative images of God have been forbidden. Instead, mosques are covered in geometric tapestries as an expression of the divine. The 8-spokes *Dharma wheel* is prevalent in Hinduism and Buddhism, and describes practises that one should follow to attain liberation. They believe that the body consists of an energy system called *chakras*, which are represented geometrically as *mandalas*, reflecting the Universe. In Judaism, the *Star of David* stands for the opposite forces of nature, which is also expressed in the *Yin and Yang* of Taoism. In *Freemasonry*, esotericism, and mysticism, symbols such as the pentagram are used to convey hidden truths and believed to hold transformative powers.

The relationship between symbolism and geometry is known today as *Sacred Geometry*, which has gained popularity within the *New Age movement*. Central to this is the *Flower of Life*, which is a common motif in logos, designs, and tattoos. One of the oldest depictions is etched into the temple of Osiris in Abydos, Egypt, dating to about 3,000 BC. It is also found across Europe, Asia, North America, and even appears in da Vinci's notebooks. Research reveals how it seems to be interwoven with every geometric principle that appears throughout symbolism, nature, and even science.

## Geometric Architecture



## Religious Symbols



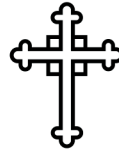
**Jesus Fish**  
*Christianity*



**Chalice Well**  
*UK*



**Triquetra**  
*Celtic*



**Cross**  
*Christianity*



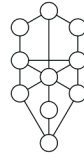
**Ankh**  
*Ancient Egypt*



**Star of David**  
*Judaism*



**Merkaba**  
*Kabbalah*



**Tree of Life**  
*Judaism*



**Dharma Wheel**  
*Buddhism*



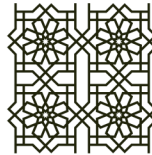
**Sri Yantra**  
*Hinduism*



**Swastika**  
*Hinduism*



**Yin and Yang**  
*Taoism*



**Islamic Art**  
*Islam*



**Pentagram**  
*Wicca*

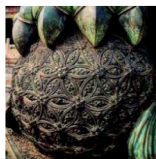


**Flower of Life**  
*Sacred Geometry*

## The Flower of Life



**Ephesus**  
*Turkey*



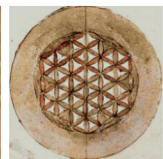
**Beijing**  
*China*



**Hampi**  
*India*



**Abydos**  
*Egypt*



**Da Vinci**  
*Italy*

# Geometry in Human History

From ancient structures to the modern age

---

From before recorded history, geometry has played a central role in the development of human consciousness. Anthropologists have discovered simple geometric figures in caves of prehistoric times, predating the end of the last ice age, over 40,000 BC. The oldest was discovered near Ramla in Israel, from 120,000 years ago! Many of this geometric cave art is still employed in the alphabets of today.

Megalithic builders constructed stone circles such as Stonehenge in England, some of which are traced back to 10,000 BC. From around 4,500 BC, the earliest civilisations started to emerge; Mesopotamia, Ancient Egypt, and the Indus Valley, followed by China, and Mesoamerica. All built structures with incredible accuracy, embodying geometric principles, often related to astronomical observations. The Ancient Egyptians, one of the most long-lasting dynasties, held power for around 3,000 years. Amongst their achievements is the Great Pyramid of Giza, which still stands today as testimony to their prominence. As the Egyptian Empire fell into decline, the Ancient Greeks (900 BC-645 AD) were the next to embody geometric principles, developing the mathematical framework of Western Science today. However, with the rise of the Roman Empire (625 BC-476 AD) much of this knowledge was lost with the destruction of the libraries of Alexandria in 641 BC. When the Roman Empire fell, Europe was plunged into the Dark Ages. However, at about this time, the Islamic Golden Age began (622 AD). Again, at its core, we find geometry, which was used to establish new scientific and mathematical ideas. This period ended around 1258 AD, when the Mongols held siege to the city of Baghdad. Subsequently, the Renaissance arose in Europe, with thinkers such as Leonardo da Vinci (1452–1519) paving the way for the rediscovery of the Platonic and Archimedean Solids. This initiated the scientific revolution, culminating with Newton's Laws in 1686 AD, which radically altered our perception of the world. To this day, geometry continues to be a key component of Modern Science, and Technology.

# Timeline history



**> 40.000 BC**  
Ice Age  
Cave art



**> 10.000 BC**  
Megalithic Era  
Stone circle



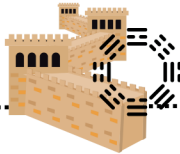
**2,500 BC**  
Indus Valley  
Vedic knowledge



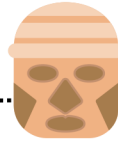
**2,500 BC**  
Ancient Egypt  
Great Pyramid



**4,500 BC**  
Mesopotamia  
Wheel, time



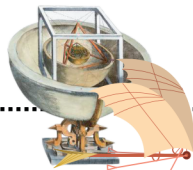
**2,100 BC**  
Ancient China  
Great Wall



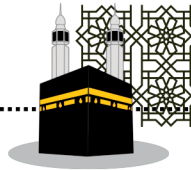
**2,000 BC**  
Olmec  
Colossal heads



**700 BC**  
Maya, Inca, Aztec  
Pyramids, Calendar



**1500**  
Renaissance  
Cosmology



**622 BC**  
Islamic Golden Age  
Mathematics & Art



**600 BC**  
Ancient Greece  
Pantheon, Geometry



**1600**  
Scientific Revolution  
Newton's Laws



**2023**  
Today's science  
Tech & IT

# Discovery of Platonic solids

## From Ancient Greece to the Renaissance Period

---

The Platonic solids are a set of five regular polyhedra that have fascinated mathematicians and philosophers for centuries. These were described by the Ancient Greek philosopher Plato in 360 BC, however, they were already discovered before his time by Pythagoras (570 BC) and Theaetetus (417 BC). In fact, evidence of their existence can be traced back much further in history. A set of carved stone balls found in Aberdeen, Scotland, from around 3,500 BC, show a striking similarity to the five solids.

Plato suggested that the physical world was a reflection of these ideal 3D forms as the building blocks of everything – a precursor to modern atomic theory. He associated the 4 elements, Fire, Water, Earth, and Air, to each, with Aristotle later ascribing the Aether to the Dodecahedron. Proof that there are only 5 Platonic solids was established by Euclid, whose famous work, *the Elements*, published around 300 BC, laid the foundation for *Euclidean Geometry*, the study of points, lines, planes, and shapes. This had significant influence on our scientific understanding of the Universe and became the cornerstone of mathematical education today.

After the fall of the Roman Empire, knowledge of the Platonic solids was lost until their gradual rediscovery throughout the Renaissance in the 15th and 16th century. The most famous example from this period is Luca Pacioli's 1494 book, *De Divina Proportione*, which was illustrated by polymath Leonardo da Vinci.

In his first major work, *Mysterium Cosmographicum* (1596), astronomer Johannes Kepler suggested that the ratios of the orbits of the six known planets could be defined by sets of the nested Platonic solids. Through meticulous study of the solar system, Kepler derived his three laws of planetary motion. The resurgence of interest in geometry also played a significant role in Newton's formulation of gravitational theory.

More recently, the Platonic solids provided the inspiration for Erwin Schrödinger, who in the 1920s developed a set of equations that revolutionised quantum theory.



# The 5 Platonic Solids



Aberdeen, Scotland (3,500 BC)



**Tetrahedron**  
**Fire**



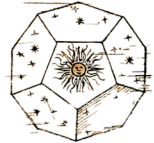
**Icosahedron**  
**Water**



**Cube**  
**Earth**



**Octahedron**  
**Air**



**Dodecahedron**  
**Aether**



**Pythagoras**  
**(570 BC)**



**Plato**  
**(428 BC)**



**Aristoteles**  
**(384 BC)**



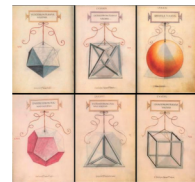
**Euclid**  
**(300 BC)**



**Luca Pacioli**  
**(1445)**



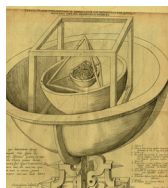
**Leonardo da Vinci**  
**(1452)**



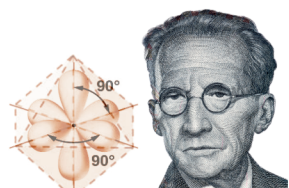
**De Divina Proportione**  
**(1509)**



**Johannes Kepler**  
**(1571)**



**Mysterium Cosmographicum**  
**(1596)**



**Erwin Schrödinger**  
**(1887)**

## The 5 Elements

Fundamental building blocks of life

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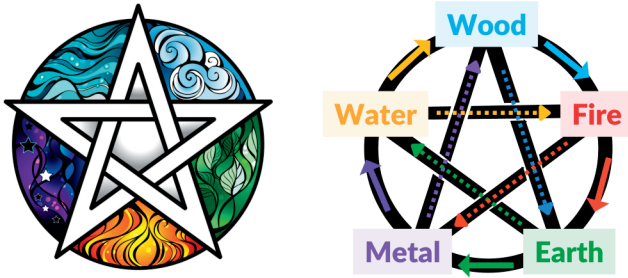
The concept of the *5 Elements* has been employed by a diverse range of cultures as the essential constituents that compose the Universe and all its phenomena. These elements – Fire, Water, Earth, Air, and Aether – are each associated with specific attributes and characteristics, which express nature's interconnectedness.

The Indian system has several interpretations of the *5 Elements*: Earth (*Prithvi* or *Brahma*), Water (*Jala* or *Varuna*), Fire (*Agni*), Air (*Vayu*), and Aether or Space (*Akasha* or *Indra's Net*). These are often embodied as celestial beings called *Devas*. Indigenous cultures in the Americas also recognise the interplay of these elements in their cosmologies. The specifics vary among tribes, but often include Fire, Water, Earth, Air, and Spirit. Classical Greek philosophers initially proposed 4 Elements of Fire, Water, Earth, and Air. Later, the 5th Element, Aether or Quintessence, was added by Aristotle.

Chinese philosophy expresses the *5 Elements* as Fire (Huo), Water (Shui), Earth (Tu), Wood (Mu), and Metal (Jin). Known also as the *5 Phases* (Wu Xing), each represents the qualities, cycles, and correspondences in nature, such as seasons, colours, and even organs within the human body.

The concept of the *5 Elements* differs across cultures, depending on their understanding of the Universe at that time. However, by the end of the 13th century, European Alchemy only represented 4 out of the 5 Elements (Fire, Water, Earth, and Air). Over time, the practice developed into a complex belief system, full of esoteric symbolism, where the objective was to turn lead into gold, termed the *Philosopher's Stone*. When Antoine Lavoisier (1743 – 1794) discovered the role of oxygen in combustion and identified 33 elements, which could not be reduced to smaller constituent parts, it laid the foundation for the first rational system of chemistry. This went on to produce the modern periodic table. Thus, the concept of *Elements* took on a new meaning, based on physical matter, rather than the metaphysical concept, which sees them as transformative processes that originate beyond the material world.

## The 5 Elements



Fire



Water



Earth



Air



Aether

---

## Vedic Gods



Agni



Varuna



Brahma



Vayu



Indra's net

---

## Chinese System



Fire



Water



Earth



Wood



Metal

---

## 5 Organs



Liver



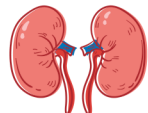
Heart



Pancreas



Lungs



Kidney

## The 5 Senses

### Perception of reality

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5 also appears as the number of senses that provide us with a means to experience physical reality. This was first recognised by Aristotle (384-322 BC), who characterised them as sight, sound, smell, touch, and taste. Whilst other systems exist, the translation of the phenomena from the external world, into our sensory perception can be adequately categorised into these five types.

Sight is carried by a small portion of the visible electromagnetic spectrum (Aether). Out of the five, it is the only one that can experience phenomena beyond the Earth, reaching across the vast distances of space, travelling at the *speed of light*, (3,000,000 km/s).

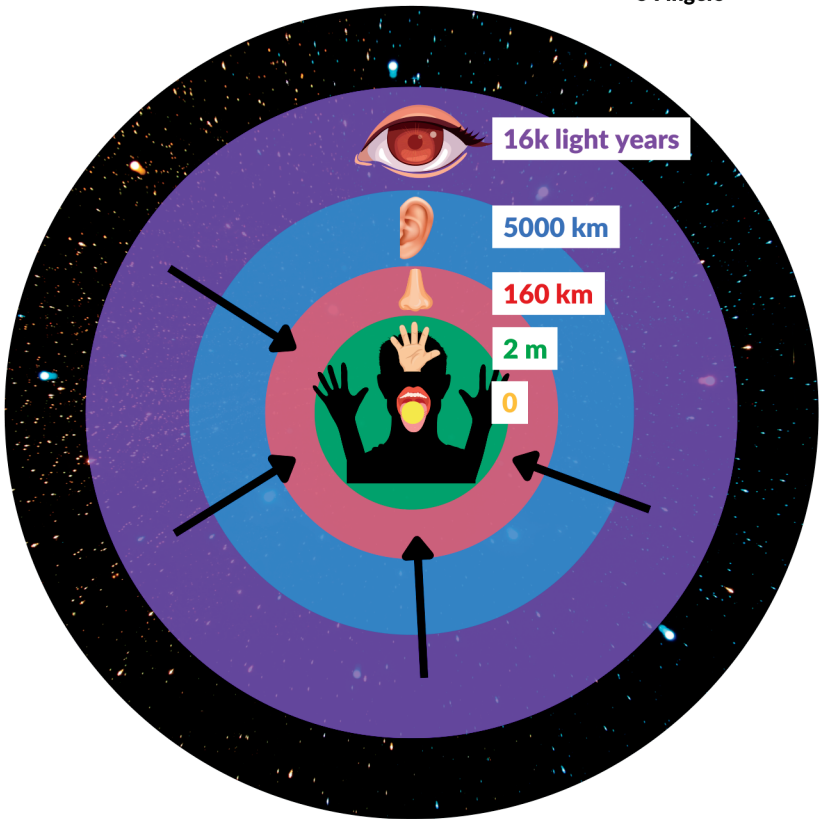
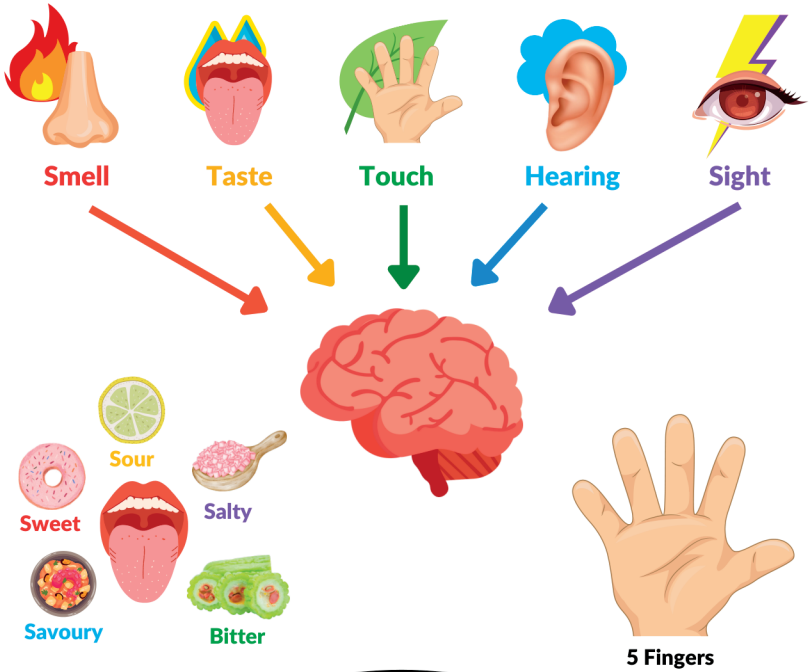
Hearing is produced from the vibration of molecules, normally experienced through the medium of air through which it travels at an average of 343 m/s. One of the loudest sounds ever recorded was the eruption of a volcano that sunk two thirds of the Indonesian island of Krakatoa in 1883. At 310 decibels, the event was heard from over 4,800 km away, as loud as cannon fire.

Smell is based on our perception of odours, which are generated through combustion, or chemical reactions (Fire). Unlike the previous senses, this is produced by atomic compounds, which interact with around 400 olfactory receptors in our nose. Only organic elements are able to generate an odour. Metals do not possess any kind of intrinsic smell, but can cause chemical reactions in organic compounds that do.

Touch is the tactile perception of objects and are sensed through physical contact with our skin receptors (Earth). Unlike the previous senses, the stimulus of touch is only found in direct proximity of our physical bodies. Technically, when we touch an object, we are sensing the electromagnetic repulsion between atoms. In truth, no-one actually touches anything.

Taste is the only sense that perceives information from inside the body, through the mouth and tongue, which is permanently moist with saliva (Water). Interestingly, according to Chinese philosophy, there are also five types of taste; sweet, savoury, salty, sour, and bitter.

# 5 Senses



# Plato's World of Forms

## The Allegory Cave

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The reoccurring patterns found in nature led Plato to the idea of the *World of Forms*. He suggested that shapes and numbers are perfect archetypes, which exist in another realm, whereas everyday objects are imperfect copies.

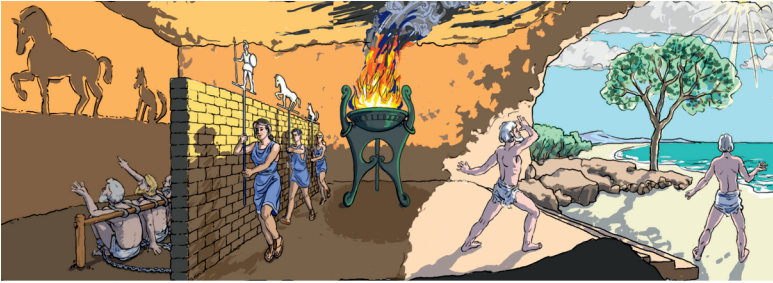
This is illustrated in his thought experiment called the *Allegory of the Cave*. It describes a group of prisoners who have been chained inside a dark cave since birth. Their only perception of reality comes from the shadows projected on a wall. One of the prisoners is set free and is faced with the outside world. Inspired by his newfound knowledge, he returns to the cave to share his discoveries. However, they reject his claims and ridicule him because they are unable to comprehend or accept his experience.

The cave represents the material world, the realm of sensory perception, that most people consider as the *only* reality. The prisoners symbolise the ordinary people who are trapped in ignorance and are unaware of the higher truths and forms of knowledge that exist beyond their limited perceptions. The freed prisoner represents the philosopher who has undergone a transformative intellectual journey and has gained knowledge of the forms, representing the ultimate realities beyond the physical world. In modern culture, this has been popularised with films such as *The Matrix*, which explores the existence of an ultimate reality beyond the brain simulation, generated through our perceptive organs.

According to Aristotle, it is through the study of *Metaphysics* (beyond matter) that enables us to delve into these fundamental aspects of reality. Form represents the essence or the specific characteristics that define a substance, while matter refers to the underlying material that takes on the form. For example, in the case of a glass of water, the form is expressed through the shape and design of the glass, whereas the matter is the water which fills it.

Similarly, the electron cloud is structured into shells (form), which are filled by discrete energy levels, generating the different types of atoms (matter).

## World of Forms



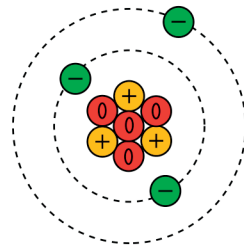
**Allegory Cave**



**The Matrix**



**Glass = Form  
Water = Matter**



**Shells = Form  
Energy = Matter**