zero

o r i g i n

Sumerian culture in Mesopotamia, about 5,000 years ago (3 B.C.)

0 as placeholder, to indicate the absence of a number in a place

Babylonians employed a number system based around values of 60, and developed a special sign (two small wedges) to differentiate between magnitudes in the same way that modern decimal-based systems use zeros to distinguish between tenth, hundreds and thousands

Mayan culture, 0 developed independently 4 A.D.   
Similar symbol to the Babylonian symbol for 0 developed, used in Mayan calendars

In early counting systems, 0 was only seen as a placeholder, not a number with its own unique value or properties.

0 was later devised in India, mathematician Brahmagupta used small dots under numbers to show a 0 placeholder, but also viewed 0 as having a null value, called “sunya”

China and Middle East : Mohammed ibn-Musa al-Kowarizmi studied and synthesized Indian arithmetic and showed how 0 functioned in the system of formulas – today known as algebra. By the 10th century, 0 had entered the Arabic numeral system in a form resembling the oval shape used today.

0 reached Europe around 1100s, mathematician \*Fibonacci helped introduce 0, informing the work of Rene Descartes, Isaac Newton, Gottfried Leibniz in the invention of calculus

Some cultures were slow to accept the idea of zero, especially the Western world. The concept of zero was met with resistance, seen as a threat to traditional religious and philosophical ideas. 0 was associated with the void, nothingness, and even chaos, which made it a controversial idea for centuries.

*“Zero is not merely a mathematical abstraction,*

*but a cultural and philosophical invention that has*

*had a profound effect on the way we view the world.”  
  
“The discovery of zero has reshaped our entire view of the universe.”*

*“Zero was the most dangerous idea ever created.”*

z e r o a n d t h e i n f i n i t e : zero is a point of balance that can simultaneously represent the smallest possible gateway to infinite possibilities (such as in calculus and limits, zero and infinity are intertwined in modern physics)

zero transcends its numerical identity, becoming a gateway to understanding the profound mysteries of life and the universe; a symbol representing infinite potential, a blank canvas from which all creation emerges and to which it ultimately returns

the v o i d from which all things emerge

*“zero is not just the absence of something;*

*it is the presence of nothing.”*

m o d e r n s c i e n c e : zero has significant implications in fields such as physicals, particularly concepts like black holes, quantum mechanics and the origins of the universe

zero is the foundation of binary code, the power of 0 permeates every aspect of modern computing, propelling technological advancements and fueling digital innovation

philosophy / key attributes / spiritual symbolism

~ symbol of infinite potential

~ beginning and end : both the initiation and the conclusion

~ connection to universal energies

~ circular journey of awakening

*c y p h e r*

*“An archetypal story of scientific discovery, wherein an abstract concept derived from the observed laws of nature is named and given symbolic form. But it is also a kind of cross-cultural fairy tale that romances reason across time and space.” themarginalian.org*

Robert Kaplan:

“If you look at zero you see nothing; but look through it and   
you will see the world. For zero brings into focus the great,   
organic sprawl of mathematics, and mathematics in turn   
the complex nature of things. From counting to calculating,   
from estimating the odds to knowing exactly when the tides   
in our affairs will crest, the shining tools of mathematics let   
us follow the tacking course everything takes through   
everything else – and all of their parts swing on the smallest   
of pivots, zero

With these mental devices we make visible the hidden laws   
controlling the objects around us in their cycles and swerves.   
Even the mind itself is mirrored in mathematics, its endless   
reflections now confusing, now clarifying insight.

[…]

As we follow the meanderings of zero’s symbols and meanings   
we’ll see along with it the making and doing of mathematics —   
by humans, for humans. No god gave it to us. Its muse speaks   
only to those who ardently pursue her.”

“names belong to things, but zero belongs to nothing. It counts the totality of what isn’t there.”

S U M E R I A N Z E R O  
numbers originally written by pressing the tip of a hollow reed to create circles and semicircles onto wet clay tablets solidified by baking, the reed eventually became a three-sided stylus, which made triangular cuneiform marks | between sixth and seventh centuries BCE, a way to wedge accounting columns apart was invented, effectively symbolizing “nothing in this column” – the concept of zero was born

G R E E K Z E R O  
Archimedes developed system for naming large numbers, “myriad” being the largest of the Greek names for numbers, connoting 10,000 | created a notion of **order** of large numbers | Greeks had no word for zero, but clearly recognized its spectral presence, Archimedes: “myriad myriads”  
  
*“how to think as concretely as we can about the very large, giving us a way of building up to it in stages rather than letting our thoughts diffuse in the face of immensity, so that we will be able to distinguish even such magnitudes as these from the infinite”   
  
“by not using zero, but naming instead his myriad myriads, orders and periods, Archimedes had given a constructive vitality to this vastness – putting it just that much nearer our reach, if not out grasp”*

I N D I A N Z E R O  
the first surviving written zero as a symbol appeared on a stone tabled dates 876 AD | mathematician Āryabhata developed a concise way to store (not calculate with) large numbers | placeholder syllable “kha” (which later became the most common Indian word for zero) was named and added to numerical system ~ evolving idea: from an empty place where a digit can lodge to “the empty number”, a number in its own right, that nudged other numbers along into their places was developed

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*“While having a symbol for zero matters, having the notion matters more, and whether this came from the Babylonians directly or through the Greeks, what is hanging in the balance here in India is the character this notion will take: will it be the idea of the absence of any number — or the idea of a number for such absence? Is it to be the mark of the empty, or the empty mark? The first keeps it estranged from numbers, merely part of the landscape through which they move; the second puts it on a par with them.”* R O B E R T K A P L A N