Cover Image: The Roundest Object in the World in a sequence of states: as a boule of natural silicon; as an approximately round matte ball behind; and in front, the polished, perfect sphere (Courtesy of CSIRO-Precision Optics)

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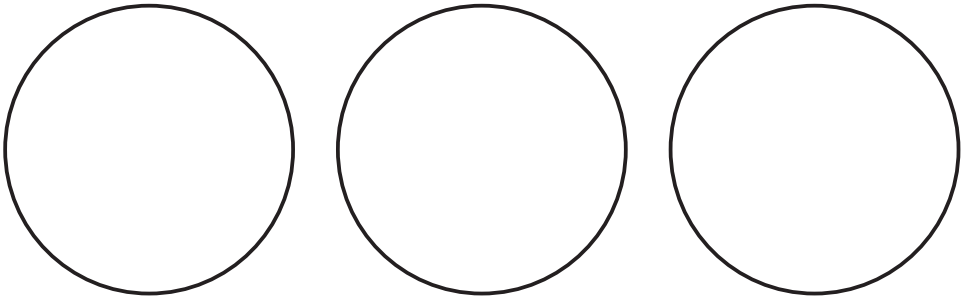
Lay down, maybe put some drone music on, light a candle or two and try to picture a two-dimensional, million-sided shape with equal angles and sides, otherwise known as a "megagon." Unless you're gifted with superhuman abilities, or you're under the influence of some really good peyote, you probably can't visualize a significant difference between this somewhat overachieving polygon and a circle. One possibility is that you end up thinking of a circle with a strange, implicit quality, which neither of us can visualize to any level of determinacy, but we both know is there. As it stands, the difference between a regular megagon and a perfect circle is so fine that even if we were able to look at one the size of the earth, we would still have a pretty difficult time telling them apart.

The megagon's slightly more relaxed, thousand-sided cousin, the chiliagon, might ring familiar. Descartes used it in one of his meditations to talk about the limit of imagination, corralling it to serve as an example of a form with definite qualities we can conceive, yet are unable to imagine in totality. While we might have trouble visualizing the difference between a megagon, chiliagon, and a perfect circle, there's nothing to stop us from graphing them in a computer program and printing them at the maximum dpi of this publication or pdf file.

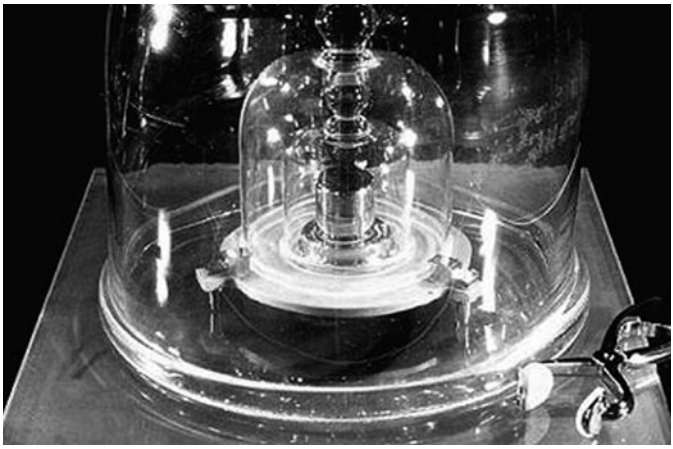


Megagon Chiliagon Perfect circle

The difference between these shapes is a defined, yet unimaginable mental playing field.

Elsewhere, at CSIRO Precision Optics in Australia, an international group of scientists working as The Avogadro Project have, with the aid of lasers, formed the Roundest Object In The World (ROITW), which serves as the "atomic clock" of weight calibration. Units like the meter and the second

are defined by measurable, intrinsic, and repeatable behaviors of light and atoms, but the kilogram standard has traditionally been weighed against an antique cylinder of platinum and iridium from 1889, which lives in a bureau in Paris.



This original kilogram loses weight every year. So far, no one can figure out why, but to address the issue, scientists at CSIRO ground a replacement—a sphere of purely stable silicon. There are a few reasons for choosing a sphere. Foremost, they don't have any edges, which might be easily damaged; also, you only need one dimension of the shape in order to calculate its volume. Incredibly precise measurement of silicon orbs is possible by way of the Avogadro constant, which it should hopefully suffice to say is an unvarying quality to do with the amount of atoms in a mass of a given substance.

Despite the exactitude, this thing basically looks like a big ball bearing. We lack the ability to visually perceive its immaculate roundness, but according to Avogadro optician Achim Leistner, if you were to enlarge one to the size of the Earth, you might notice a small ripple in the smoothness of about 12 to 15 mm, and a variation of 3 to 5 meters in the roundness. That's pretty round.

Now, returning to the matter of the megagon, imagine: anyone could walk up to us, point at our thought bubble with a smile, and say, "That's not a megagon you're visualizing, that's just a circle you're CALLING a megagon."

As it happens, we have another option. Picture a megagon whose sides are numbered clockwise from 1 to 1,000,000. Now, pick a side at random, say, side number 753,482. Next, while visualizing the entire figure in your mind, identify a point shy of 9 o'clock on your projected, unimaginable shape, a hair over from the halfway step between 700,000 and 800,000. You're in the ballpark of 753,000, but attempting any greater precision than that will probably give you a headache. Besides, you wouldn't be closer to proving to your laughing, pointing friend that you see what you see. Instead, try for a vertical, flat side numbered 750,000, at EXACTLY 9 o'clock. This imaginary side could only exist on an equilateral megagon. That is, through the narrative device of numbering the sides, then zooming in, we can build a visual metaphor to imagine part of our perceived million-sided shape, but our projection will be most viable if it is focused only on certain parts of the megagon.

Back to our actual, physical example: We can imagine the ROITW in front of us, or examine one in a picture, but to truly get a grip on this mind-bending degree of roundness, we need a *story* — just as a narrative concerning the fantastic UN-ROUNDNESS of a megagon can help us to visualize a difference between it, a circle in our mind, and the shape as a graphing program sees it. Without the narrative context to explain the formation of the ROITW, we would have a much harder time seeing the extreme difference in roundness between it and a bowling ball. At the end of the day, the *intelligible* space between megagon and circle, bowling ball and ROITW, contains two equal concepts of "resolution": namely, that meaning "imaging quality," and that meaning "the answer to a problem."

Our mentally projected megagon is a rather mysterious form. While we readily agree with the possibility of its existence, we can't picture one. Ultimately, we must resolve to accept what we can't see, but with the aid of the 9 o'clock reference, for example, we can relate to this projected shape in much the same way we relate to events in stories — AS IF they were actually occurring. This is called *suspension of disbelief.*

The phrase was coined by Samuel Taylor Coleridge to describe the tacit pact an audience makes with a work of fiction. The idea most often applies to an audience's relationship with a novel or film, but it's also minted every time you imagine a megagon. That is, our ability to make distinctions

between forms with unperceivable, albeit numeric qualities is, oddly enough, sustained through storytelling.

Famously, German playwright Bertolt Brecht was an arch enemy of the suspension of disbelief. He reacted against those dramatic conventions designed to lull an audience into perceiving some parallel fictional world by means of the *Verfremdungseffekt* — which is variously translated as "alienation," "distancing," "defamiliarization," or "estrangement" effect.

Brecht sought to nip in the bud any illusion of reality that might inadvertently arise in the theater, ensuring audiences remained fully aware they were watching a *production,* here and now. The goal was to push the audience out of passive trance and into exhilarating critical analysis. His methods included spartan set dressing, leaving the lights on, musicians playing on-stage, and actors who smoked while winkingly drawing attention to themselves as mere representations. In this way, Brecht concerned himself with what we might call the *suspension of suspension of disbelief.* Brecht's example might be instructive for our almost-imaginable forms: can we toss ROITWs and megagons inside quotation marks?

In light of these two approaches — engagement and poetic faith on one hand, and the reflexive push of the distancing effect on the other — let's try picturing a megagon one more time.

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