Precision: The Measure Of All Things

Does size really matter? The story of our journey from sundials and cubits to time lords and lasers.

Programme running: 3 x 60 mins Production: Big Wave for BBC

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Measurement is a story that's as old as mankind. Packed with cutting-edge science, amusing anecdotes from history and jaw-dropping examples from the modern world, this is our journey from counting on our knuckles to the exploration of outer space.

With experiments both modern and ancient, the series will explain how we developed the seven international units of measurement: time, length, mass, brightness, current, temperature and moles (the measurement of atoms). How have they shaped the course of history, science and civilisation?

Time and Distance

Our ancient ancestors first made measurements using their hands and feet or a primate calendar painted on cave walls. But once humans started building grand projects for their gods, such as the sun god Ra, things needed to be more exact. The cubit rod made sure the Egyptians' pyramids met at the top, and their sundials brought order to their expanding Empire.

Yet our 'accurate' modern measurements like the metre are based on faked figures from one of the most influential cover ups in history, and the variable rotation of the planets means 'time lords' have to sneak extra seconds into our clocks now and then. Can scientists solve the problem?

Mass and Moles

Deep underground in a vault beneath Paris, which no army has dared invade, lives the definitive kilogram. But there is a problem; it's losing weight! This programme charts the history of mass measurement and the modern day race to replace the Kilo with something more stable. And we investigate the mole, a number used to measure atoms. It's so big that, if

you had a mole of dollars, you could spend a billion every day for a trillion years and still have change.

Energy

From lightning bolts and Watt engines to electromagnetic waves and single electrons, our final programme looks at the measurement of light, electricity and heat. We've been using light to communicate for millennia, with fire beacons saving the British Isles from invasion, and yet only recently has it been given a unit of measurement.

Temperature measurement has stumped the greatest minds in history, but can we really measure it better using the speed of sound? This episode also revisits Thomas Edison and the mystery of Absolute Zero, as we see how the drive for better measurement has led us deep into space and inside the fabric of atoms themselves.

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