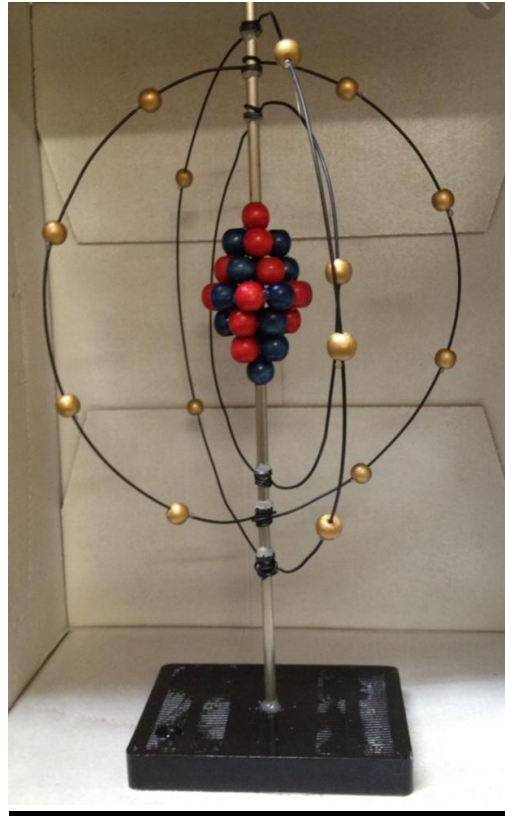
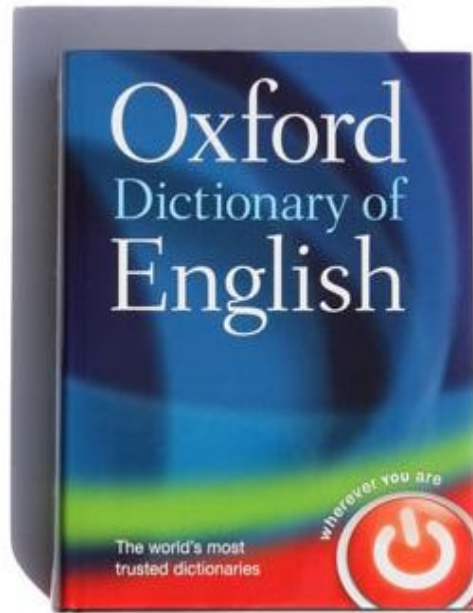


**How is current knowledge shaped  
by its historical development?**

**(Word count = 944 words)**



The object shown above is a 3D representation of one of the most widely accepted models of the atom, developed in 1913 by Danish scientist Niels Bohr, this one in particular being home-made as a science project by an American student. Although, in effect, this model represents a concept, the knowledge that was used to create it has evolved significantly whilst at the same time developing the same fundamental and historical concepts. In the 5th century BC, the Greek scientist Democritus first put forward the idea that matter was created by tiny indivisible particles that cannot be split, and this revolutionary laid the foundations of the concept of the atom. It wasn't until 1808 when John Dalton revisited this idea, and that prompted JJ Thomson in 1904 to develop his "plum pudding" model, where he presented the atom as a positively charged mass with negatively charged particles inside. With the development of all of this knowledge, it must be noted that all scientists essentially developed their ideas based on the same fundamental foundations; all models used the idea that atoms and their subatomic components cannot be split, at the same time new concepts have been introduced and following experiments, kept, or disapproved. Following some experiments conducted by Ernest Rutherford however, Thomson's model was indeed quickly disapproved following the discovery of the position of electrons. Consequently, Niels Bohr developed his model, which used some elements of Thomson's as well as the main fundamental knowledge mentioned earlier, although he proposed that electrons orbited outside the nucleus in orbits. Since the development of his model and the current quantum-mechanical model later developed in 1926, Bohr's model is now regarded as being highly simplified as the proportions between subatomic particle sizes are not realistic, the same applying to the positions of electrons. Even then, Bohr's model is still widely taught today as it is not incorrect, although simplified, and serves as a good introductory model for educational settings.



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The second object, shown above, is a copy of the 11.7.712 version of the Oxford English Dictionary as published by Oxford University Press, released in 2020, which is the most recent edition. Dictionaries have always served as a method of capturing and compiling every possible grammatically correct written aspect of a culture's language in one place, as in order to preserve a culture's knowledge, a complete written record of its language is vital, and due to language constantly changing dictionaries are updated regularly. The first Oxford English Dictionary was released onto the market in 1884 and since then, hundreds of thousands of new words have been added, and a large number omitted as well. The knowledge of when words are used and in which context is based purely on the historical knowledge of fundamental language features. Each society's historical knowledge of word use is passed both through text and through the generations in certain ways which sets the context of each word. To an extent, all languages have developed from a select few ancient languages and many words are variations on previously-existing words adapted to be used in a different context. Nowadays, the addition of new words relies heavily on social media, as now language develops faster as people can communicate new ideas freely and easily, often creating their own slang terms or variations of a word that begin to be used by large numbers of people. Over the course of time, a few words can also change their meanings quickly, an example of this being the word *gay*, which has been subjected to many changes in its meaning and usage over time, as society has changed. Up until the 1960s, the word was still commonly used as an adjective to mean joyful, or happy, but in conjunction it was beginning to be used to define people's sexuality.



This rather odd yet unassuming object, developed by Philips in 2009, represents a technological paradigm shift that was only possible by using historically developed knowledge and adapting it to perform a different function. This example is featured in a Belgian online museum's collection. The first LED (light emitting diode) was discovered in 1907 in Germany, but the technology wasn't useful as the light emitted was practically invisible and so the concept was not experimented with any further. However after the rediscovery of some older knowledge and some experimentation in the USA in the 1960s, a visible red LED was developed, which sparked much more experimentation with the new technology being later employed elsewhere. By the 1980s a large colour range of diodes had been developed, and many pieces of technology featured LEDs. For a long time, a dilemma was present in the lighting world: as current light sources were so inefficient, what modern, practical and efficient solution could replace all of these? A question made increasingly more important and relevant with a rise in the levels of climate change worldwide. Until then, a white LED had not yet been developed, but after much experimentation using knowledge that was historically available, the first commercially available white LED light bulb was released onto the market in 2002, designed to replace household bulbs. It was costly and not very practical, but the idea was experimented with much further up until 2009, when Philips would go on to release their own high efficiency model shown above, which served as the first direct and practical replacement for older low efficiency filament bulbs. This marked a major technological breakthrough, and nowadays further advances in LEDs have resulted in the technology being employed for lighting in most areas, using all prior knowledge and knowledge developed upon by Philips.

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Photo 1: <https://www.pinterest.co.uk/pin/144396731786535737/>

Photo 2:

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