# What is Quantum Science?

A quantum is the smallest possible unit of anything, and Quantum Science is the study of these particles and their application. In other words, we know that all matter is made of atoms, but what is the smallest component of an atom and how does it react to stimuli? That deceptively simple explanation is an introduction to a field of science that is exploding into the disciplines of engineering and technology.

# History of the Quantum Science

How and why did this science begin? According to the website [Whatis.techtarget.com](http://whatis.techtarget.com/definition/quantum-theory) the science had its beginnings at the turn of the twentieth century with the research of a physicist named Max Planck. Doctor Planck reasoned that since all matter is made up of individual units, energy might be as well. His research explored why glowing objects changed from red to orange and finally to blue as their heat increased. The behavior could be explained if the radiant energy existed as individual units instead of as rays, which was the conventional thought at the time.

From that point, scientists began to look at these small particles and their behavior, eventually using the research in the miniaturization of circuitry on microchips. The problem in computer science is that this miniaturization is required for computers to process data. With the deluge of new information that must be catalogued and processed securely as well as the requirements that new scientific discoveries place on computers, the machines w

# Practical Applications

All of this can seem “other-worldly,” but the principles are already at use in our own world. The atomic clock was invented using quantum principles. That involves more than making certain people arrive at appointments; the world’s stock markets and GPS systems rely on accurate time reckoning.

According to an article in [smithsonianmag.com](http://www.smithsonianmag.com/ist/?next=/science-nature/five-practical-uses-spooky-quantum-mechanics-180953494/), quantum principles are the foundation of “quantum cryptography,” or sending messages through a quantum channel which makes them virtually undecipherable to anyone without the quantum “key.” The concepts also are resulting in super-fast computers. Many of the technologies we take for granted today rely on mathematical formulas and equations. As the technology advances, these equations will get more complex. Current computers could take literally “forever” to process them. Theoretically, quantum computers could solve them in seconds.

That word “theoretically” is the crux of the science. A lot of what research and theory hint at is still only conjecture. There is much left to discover and so many applications to the research that they would create a new world. There are issues of ethics and practicality that complicate the field of Quantum Science and yet the future to the science is a door that cannot be closed now that it is open.