

# Isaac Newton

## Biography / Overview

Isaac Newton (4 January 1643 – 31 March 1727, N.S.) was an English mathematician, physicist, astronomer, alchemist, theologian, and author who emerged as one of the defining figures of the Scientific Revolution. Born in Woolsthorpe, Lincolnshire, Newton overcame early adversity after the death of his father and a difficult family life. He entered Trinity College, Cambridge, in 1661, where he was introduced to the “new philosophy” of figures like Galileo and Descartes but was largely self-taught in mathematics and natural philosophy. Newton’s academic career was marked by solitary study, explosive intellectual breakthroughs, and eventual recognition by the Royal Society. His magnum opus, the *Philosophiæ Naturalis Principia Mathematica* (“Mathematical Principles of Natural Philosophy,” 1687), reformulated the scientific view of the universe with his laws of motion and law of universal gravitation. Beyond physics and mathematics, he made lasting contributions to optics, built one of the first reflecting telescopes, and engaged in profound, if controversial, theological and alchemical studies. Later, Newton served as Warden and then Master of the Royal Mint, taking an active role in monetary reforms and anti-counterfeiting. Knighted by Queen Anne in 1705, he spent his final years as a prominent public figure and President of the Royal Society, dying in London at 84.

Sources:

<https://www.britannica.com/biography/Isaac-Newton>

[https://en.wikipedia.org/wiki/Isaac\\_Newton](https://en.wikipedia.org/wiki/Isaac_Newton)

<https://www.biography.com/scientists/isaac-newton>

## Bibliography / Primary Sources

Major Published Works:

*Philosophiæ Naturalis Principia Mathematica* (1687, 2nd ed. 1713, 3rd ed. 1726)

*Opticks: Or, A Treatise of the Reflections, Refractions, Inflections & Colours of Light* (1704)

*De analysi per aequationes numero terminorum infinitas* (1669, published 1711)

*Method of Fluxions* (1671, published 1736)

*Arithmetica Universalis* (1707)

*The Chronology of Ancient Kingdoms Amended* (1728, posthumous)

*Observations upon the Prophecies of Daniel and the Apocalypse of St. John* (1733, posthumous)

An Historical Account of Two Notable Corruptions of Scripture (published 1754)

Primary Manuscript Repositories:

The Newton Project (digitized manuscripts): <https://www.newtonproject.ox.ac.uk/>

The Correspondence of Isaac Newton (ed. H.W. Turnbull et al.)

Sources:

<https://plato.stanford.edu/entries/newton/>

<http://sirisaacnewton.info/writings/>

<https://www.newtonproject.ox.ac.uk/>

### **Birth Date / Death Date**

Born: January 4, 1643 (December 25, 1642, Old Style), Woolsthorpe, Lincolnshire, England

Died: March 31, 1727 (March 20, 1727, Old Style), London, England

Sources:

<https://www.britannica.com/biography/Isaac-Newton>

<https://nationaltoday.com/birthday/isaac-newton/>

<https://www.biography.com/scientists/isaac-newton>

### **Notable / Best-Known For**

Formulating the three laws of motion and the law of universal gravitation.

Authoring the *Principia Mathematica*, foundational to classical physics.

Development of calculus (independently of Leibniz).

Foundational work in optics, including the theory of light and color.

Invention of the reflecting telescope.

Sources:

<https://www.britannica.com/biography/Isaac-Newton>

<https://www.biography.com/scientists/isaac-newton>

<https://www.bbc.co.uk/teach/articles/zh8792p>

### **Famous Quotes**

“If I have seen further it is by standing on the shoulders of giants.” (Letter to Robert Hooke, 1675)

“To every action there is always opposed an equal reaction.” (*Principia Mathematica*, Book I, Third Law)

“Truth is ever to be found in simplicity, and not in the multiplicity and confusion of things.”

“I do not know what I may appear to the world, but to myself I seem to have been only like a boy playing on the seashore ... whilst the great ocean of truth lay all undiscovered before me.”

Sources:

<https://www.isaacnewton.org/quotes.jsp>

[https://www.goodreads.com/author/quotes/135106.Isaac\\_Newton](https://www.goodreads.com/author/quotes/135106.Isaac_Newton)

### **Major Works / Textual Contents**

Philosophiæ Naturalis Principia Mathematica (1687, 1713, 1726):

Book I: The motion of bodies (laws of motion, calculus, inertial frames)

Book II: Motion in resistant mediums

Book III: The system of the world (universal gravitation, planetary motion)

Opticks (1704):

Experiments with light and prisms; analysis of color, reflection, and refraction.

Arithmetica Universalis (1707):

Treatise on algebra, equations, and problem-solving.

The Chronology of Ancient Kingdoms Amended (1728):

Historical treatise on biblical chronology.

Sources:

<https://plato.stanford.edu/entries/newton/>

<http://sirisaacnewton.info/writings/>

<https://www.poetryfoundation.org/poets/john-milton> (for comparison structure)

### **Influences / Intellectual Context**

Built upon classical traditions: Euclid, Archimedes, and Ptolemy in mathematics and astronomy.

Responded to and critiqued works by Galileo, Descartes, and Kepler (mechanics, heliocentrism).

Deeply influenced by biblical studies and alchemical traditions.

Engaged with contemporaries: Robert Hooke, Edmond Halley, Gottfried Wilhelm Leibniz.

Active in the Scientific Revolution and early Enlightenment, impacting the Royal Society and beyond.

Sources:

<https://www.britannica.com/biography/Isaac-Newton>

<https://plato.stanford.edu/entries/newton-philosophy/>

<https://www.bbc.co.uk/teach/articles/zh8792p>

### **Legacy and Modern Significance**

Newton's laws form the backbone of physics and engineering curricula worldwide.

Calculus is core to mathematics, science, and engineering.

*Principia Mathematica* and *Opticks* remain central texts in the history of science.

Newton's methods of scientific inquiry and emphasis on experimental evidence endure in scientific practice.

He continues to inspire philosophical, theological, and historical studies due to his broad intellectual vision and lasting contributions.

Sources:

<https://www.britannica.com/summary/Isaac-Newtons-Achievements>

<https://www.confinito.com/legacies/isaac-newton>

<https://www.bbc.co.uk/teach/articles/zh8792p>

### **Modern Moments / Impact on the 21st Century**

2023: *Principia Mathematica* and *Opticks* available as digital facsimiles via The Newton Project.

2025: BBC Teach and other major educational outlets produce new documentaries on Newton's influence.

Ongoing: The Newton Project (Oxford University) continues to digitize and disseminate his manuscripts.

Ongoing: Newton's laws, ideas, and biography feature in STEM education at K–12 and university levels globally.

Sources:

<https://www.newtonproject.ox.ac.uk/>

<https://www.bbc.co.uk/teach/articles/zh8792p>

<https://fivebooks.com/best-books/isaac-newton-william-newman/>

## Suggested Reading and Resources

### A. Secondary Literature (Scholarship)

Westfall, Richard S., *Never at Rest: A Biography of Isaac Newton*. Cambridge: Cambridge University Press, 1980.

Feingold, Mordechai, *The Newtonian Moment: Isaac Newton and the Making of Modern Culture*. Oxford: Oxford University Press, 2004.

Hall, A. Rupert, *Isaac Newton: Adventurer in Thought*. Oxford: Blackwell, 1992.

Iliffe, Rob, *Newton: A Very Short Introduction*. Oxford: Oxford University Press, 2007.

Cohen, I. Bernard, and Smith, George E., eds. *The Cambridge Companion to Newton*. Cambridge: Cambridge University Press, 2002.

### B. Archival or Online Sources

The Newton Project (digitized manuscripts and correspondence):

<https://www.newtonproject.ox.ac.uk/>

*Principia Mathematica*, Cambridge University digital edition:

<https://cudl.lib.cam.ac.uk/view/MS-ADD-03900/1>

Stanford Encyclopedia of Philosophy, “Isaac Newton” entry:

<https://plato.stanford.edu/entries/newton/>

BBC Teach, “Isaac Newton: The man who discovered gravity”:

<https://www.bbc.co.uk/teach/articles/zh8792p>