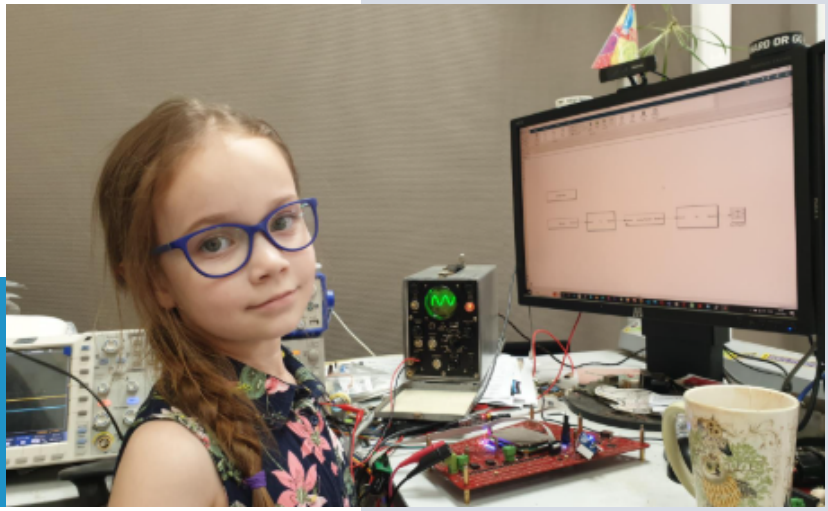
Birth of the Scientist



A young learner explores electronics with an oscilloscope, echoing the long tradition of makers and thinkers whose evolving roles eventually required a new word to describe them: scientist.

Credit: Maksim Popov https://commons.wikimedia.org/w/index.php?curid=132199531

Famous early scientists, like Leonardo da Vinci, would not have called themselves scientists, or practiced science as we do today.

They were then more commonly called 'natural philosophers,' and based their work on observing the natural world, then inferring principles. Until Sir Isaac Newton, and his colleague Sir Francis Bacon, moved to standardize the scientific method.

They wanted proof; knowledge based on evidence, not speculation. So they argued that scientists should put forth a hypothesis, often an if-then statement: "If this happens, then that will be the result." Then, they should create an experiment to prove or disprove the hypothesis.

Data from the experiment should be collected, as objectively as possible. Then published, so that peers could review and challenge the work.

Only after standing up to this process, they argued, could science be credible. Their peers recognized the value of this scientific method, and, through the 1700s, it was refined and widely adopted.

But it wasn't until 1834 when William Whewell proposed calling those working in science 'scientists,' borrowing from the word 'artist,' to emphasize the creativity required. It took a few decades, but the term 'scientist' stuck. And the scientific method certainly did too – and has transformed and advanced evidence-based science ever since.

I'm Dr. Scott Tinker, and I'm a scientist.

SWITCH ENERGY ALLIANCE

Background: Birth of the Scientist

Synopsis: The early 1800s saw a surge in discoveries, instruments, and methods that transformed how humans studied the natural world. Existing titles failed to capture this changing role, prompting the invention of the word scientist to describe a new kind of thinker and maker. The story of the term reveals how language evolves alongside scientific progress.

The Birth of a Word

- Each year, new words slip into the English language. Some are from pop culture like skibidi or goated, while others, like generative AI or derecho, emerge to describe new discoveries or technologies.
- Around 200 new terms are added to dictionaries annually, and the language races to keep up. Other words, though, feel timeless, as if they've been with us forever.
- The word "scientist" seems like one of those. Humans have been doing science for thousands of years, yet the word scientist is less than 200 years old. It first appeared in 1834.
- Before that, people who studied the natural world went by many names including philosopher, natural philosopher, polymath, savant, or man of science.
- But the terminology of the 1800s was still tied to older traditions. As scientific practice became more experimental and specialized, English lacked precise words for these newer activities.

More Science, More Words

- During the 18th and 19th centuries, science and technology flourished, and language had to flourish right alongside them. With each new discovery, new words were needed to communicate entirely new ideas.
- Some terms grew out of specialized fields, like tonsillitis, first used in 1801 to describe inflammation of the tonsils. Others came from the traditional Greek or Latin such as anode (ascent) and cathode (decent), suggested to Michael Faraday to explain the direction of current flow in an electrochemical cell.
- Some words evolved from local names that expanded their meaning over time. Kiwi first referred to a flightless New Zealand bird, then to the people of the region, and much later, to the familiar, green-fleshed fruit.
- Meanwhile science itself was exploding. New experiments about chemistry, global discoveries in botany, and inventions like the steam engine, telegraph, and early batteries are just a few examples of the new science of the era. These advances helped give rise to new fields, including the emerging science of thermodynamics.
- The English language scrambled to keep up as submarines, parachutes, vaccines, and other inventions arrived almost faster than anyone could name them. Every day brought something new.
- With every new branch of knowledge came new tools, new methods, and new types of experts. But there still wasn't a single word to describe the people who did all this work. Science had outgrown its old titles.

Background: Birth of the Scientist

The Scientific Revolution

- English statesman Sir Francis Bacon is often credited with shaping the early scientific method. Before his ideas took hold, philosophers were encouraged to rely on their senses and reasoning to identify truths about the natural world.
- Bacon argued that truth couldn't simply be assumed, but that it had to be tested. Hypotheses needed to be supported by repeated experiments that produced consistent results. This shift marked a turning point. Knowledge would now be built on evidence, not speculation.
- The invention of the printing press accelerated this transformation by standardizing letters and numbers and allowing ideas, data, and diagrams to circulate widely. "Men of science" could now compare results, refine methods, and build on one another's work.
- Artisans and artists proved to be more than just helpers. Their craftsmanship shaped the very instruments that made new discoveries possible. In many cases, science advanced only because creativity and precision from the arts made it possible to "see" what the world contained.
- As science became more experimental and hands-on, the old-world philosopher no longer fit, and no one agreed what word should replace it.

The Golden Age of Discovery in Britain

- Britain in the early 1800s buzzed with scientific excitement. At the Royal Society of London, some of the world's boldest thinkers and makers were unraveling the mysteries of geology, electricity, and astronomy, armed with new instruments crafted by artisans and illustrators.
- Among them was William Whewell (HEW-ell), a brilliant polymath who loved naming things.
  - Working with electrical pioneer Michael Faraday, he coined ion, anode, and cathode.
  - For geology, he named epochs like the Eocene, Miocene, and Pliocene.
  - He treated language as a set of tools that was just as essential as lenses or batteries.
- Another towering figure was Mary Somerville, a Scottish mathematician whose sweeping understanding of physical science unified astronomy, physics, chemistry, geology and mathematics.
  - Her 1834 bestseller, On the Connexion of the Physical Sciences, revealed a world tied together through common laws. Her work so impressed the Royal Astronomic Society that they admitted her as their first female honorary member.

In this wood engraving of a Royal Society meeting chaired by Isaac Newton, natural philosophers present and question new findings, representing the shift toward more experimental, evidence-based inquiry that later demanded a new title for scientific investigators.

Credit: https://wellcomecollection.org/works/k34excvx CC-BY-4.0, CC BY 4.0 https://commons.wikimedia.org/w/index.php?curid=35962836

Background: Birth of the Scientist

- Somerville and Whewell exemplified a rising model of science that relied on experiment, built instruments, synthesized ideas, and uncovered patterns in nature.
- But at a major scientific meeting, poet Samuel Taylor Coleridge argued that "men of science" were not philosophers but simply workers performing tasks liked grinding lenses or mixing chemicals.
- To many in the audience, "workers" implied low social rank.
- As Coleridge highlighted just how inadequate the old labels had become, suddenly, the room confronted a crisis of identify. If these investigators were no longer philosophers, and refused the label of workers, what were they?

This late-1700s telescope showcases the precision and craftsmanship of artisans whose work made scientific discovery possible. Its ornate design reflects a time when exploring the natural world depended as much on skilled makers as on careful observers.

Credit: Thomas Quine - 1748 antique telescope
https://commons.wikimedia.org/w/index.php?curid=145856278

Who Invented the Word Scientist?

- Listening to Coleridge's complaint, Whewell proposed a novel solution: "analogy with artist we form scientist."
- Just as an artist creates through skill and imagination, a scientist, he argued, creates knowledge through observation, experiment, and craft. Not merely a thinker, but a maker.

This 19th-century rendering of Durio zibethinus captures the precision that defined the era's scientific efforts. As illustrations grew more detailed and discoveries multiplied, language had to evolve to keep pace with how much there was to describe.

Credit: Creator:Hoola Van Nooten (fl 1863-1885), - https://gop.com.ph/philippine-clients/antique-prints/durio-zibethinus-l-local-name-durian/, Public Domain, https://commons.wikimedia.org/w/index.php?curid=599340

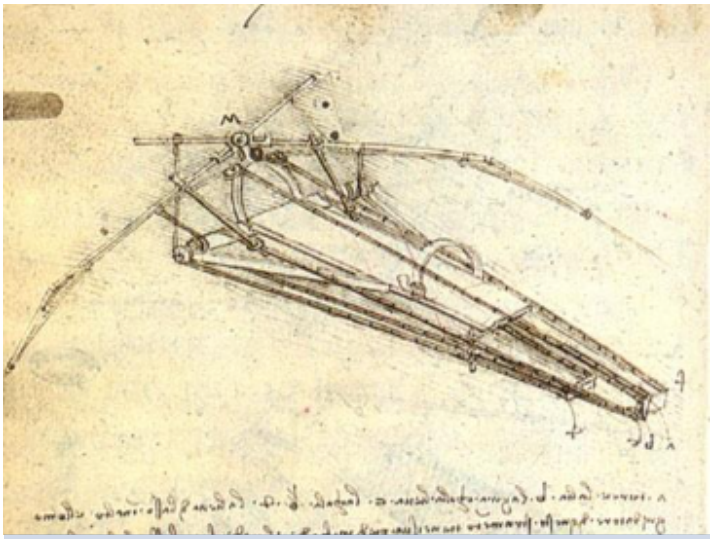
- In Whewell's mind, creativity was central to scientific progress. You could not do science without imagination or without the tools and illustrations crafted by artists.
- Whewell believed the term fit Mary Somerville perfectly. Her broad, interconnected work exemplified the creative and systematic practice he envisioned. Others thought the term should apply to specialists in emerging fields of chemistry, geology, or botany. The debate continued.
- The new title caught on quickly in America but took decades to be widely accepted in Europe.

Background: Birth of the Scientist

- As science fractured into dozens of specialties, the world finally needed an umbrella term, one broad enough to include everyone from chemists to geologists to naturalists.
- "Scientists" finally found its place.

What is a Scientist?

- Today, we use the word scientist without a second thought, but it carries the legacy of an era when discovery was growing faster than language.
- It reminds us that science is both creative and technical, both precise and imaginative. It remains a blend of artist and investigator.
- And just like in the 1830s, new knowledge continues to reshape the words we need to describe our world.



A sketch of a flying machine by Leonardo da Vinci, whose inventive designs blended careful observation with artistic imagination. Like other early investigators who bridged disciplines, his work shows how creativity and craftsmanship helped shape the foundations of modern science.

Credit: Leonardo da Vinci - http://www.drawingsofleonardo.org, Public Domain. https://commons.wikimedia.org/w/index.php?curid=59557

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Contributors: Lynn Kistler, Harry Lynch

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