Learn about women scientists who broke boundaries and made important discoveries



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Answer key on page 4

Alice Ball Barbara McClintock Bertha Parker Donna Strickland Dorothy Hodgkin Jane Goodall Lise Meitner Mae Jemison Marie Curie Marie Maynard Daly Maria Goeppert Mayer Mary Golda Ross Mary Jackson Mary Leakey

Rachel Carson Rosalind Franklin Tu Youyou Valentina Tereshkova Vandana Shiva Wangari Maathai



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- 1. Marie Curie (1867-1934) Polish-born French physicist and chemist. She was the first woman to be awarded a Nobel Prize (Physics), in 1903, for her research on X-rays and radioactivity, and the first person to be awarded a second Nobel Prize (Chemistry), in 1911, for her discovery of the elements polonium and radium.
- 2. Lise Meitner (1878-1968) Austrian-born nuclear physicist. Her research led to the discovery of uranium fission, for which only her male colleague, Otto Hahn, was awarded the Nobel Prize in 1945. In 1997, an element was named meitnerium (Mt) in her honour.
- **3.** Alice Ball (1892-1916) Black American chemist. She developed the first effective treatment for leprosy, later known as the Ball Method, which was widely used for over thirty years until the introduction of sulfone drugs.
- **4. Maria Goeppert Mayer** (1906-1972) German-born American mathematician and physicist. She was awarded the Nobel Prize in Physics in 1963 as part of the team that discovered the shell structure of atomic nuclei.
- **5. Barbara McClintock** (1902-1992) American geneticist and pioneer in plant cytogenetics. She was awarded the Nobel Prize (Physiology) in 1983 for her discovery that genetic elements in maize chromosomes could change position, causing other genes to become active or inactive.
- **6. Rachel Carson** (1907-1964) American environmentalist and biologist. She wrote about the effects of chemical pesticides in her landmark book, *Silent Spring*, and is credited with starting the modern ecological movement.
- 7. Bertha Parker (1907-1978) Self-taught Seneca Nation archaeologist. Her discovery in 1930 of stone tools alongside a skull of the extinct giant ground sloth was evidence that humans were in North America for at least 10,000 years.
- **8.** Mary Golda Ross (1908–2008) Cherokee mathematician and engineer. Her research into ballistic missile systems and Earth-orbital flight for Lockheed were essential for NASA's Apollo moon landing missions.
- **9. Dorothy Hodgkin** (1910-1994) British biochemist. She used X-ray crystallography to confirm the structure of biological molecules, such as penicillin, insulin and Vitamin B12, for which she was awarded the Nobel Prize (Chemistry) in 1964.
- **10. Mary Leakey** (1913-1996) British paleoanthropologist. Her discovery of footprints in East Africa in 1976 confirmed that early human ancestors walked on two feet more than 3.75 million years ago.
- 11. Rosalind Franklin (1920-1958) British biochemist. She produced X-ray diffraction images of DNA that were later used by James Watson and Francis Crick to determine the double helix structure of DNA.



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- **12. Marie Maynard Daly** (1921-2003) First Black American woman to earn a Ph.D. in chemistry, in 1947. Her studies on the biochemistry of cholesterol, sugars and proteins led to new understanding of how food and diets affect the heart and circulatory system.
- **13. Mary Jackson** (1921-2005) American mathematician. In 1958, she became the first Black female aeronautical engineer to work at NASA, where her research on air flow in wind tunnels and actual flight experiments helped improve aircraft design.
- **14. Tu Youyou** (1930- ) Phytochemist. She was the first Chinese woman to be awarded a Nobel Prize (Medicine), in 2015, for her novel bridging of Traditional Chinese Medicine and western science to develop artemisinin-based drugs to treat malaria.
- **15. Jane Goodall** (1934- ) British primatologist. She is best known for setting the standard for animal behaviour research through her decades-long work with chimpanzees in Tanzania and her global conservation work to protect wildlife.
- **16. Valentina Tereshkova** (1937- ) Russian engineer and cosmonaut. She became the first and youngest woman in space on June 16, 1963, when she spent 71 hours orbiting Earth 48 times on her solo mission aboard the Vostok 6.
- 17. Wangari Maathai (1940-2011) Kenyan environmental and political activist. She founded the Green Belt Movement in Africa to fight deforestation and promote sustainable development, for which she was awarded the Nobel Peace Prize in 2004, the first for an African woman.
- **18. Vandana Shiva** (1952- ) Indian physicist, ecologist, activist and author. She has led grassroots environmental movements in support of sustainable agriculture and food security around the world.
- **19. Mae Jemison** (1956- ) American doctor, engineer and NASA astronaut. In 1992, she became the first Black woman to travel in space, where she conducted medical research while orbiting the Earth 127 times over eight days aboard the Space Shuttle Endeavour.
- **20. Donna Strickland** (1959- ) Canadian optical physicist. In 2018, she and her PhD supervisor were awarded the Nobel Prize in Physics for developing chirped pulse amplification—ultrashort, high-intensity laser pulses, which have many applications, including in eye surgery.





#### **Answer Key**

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