Abraham Nemeth (1918–2013)

Inventor of the Nemeth Code

Abraham Nemeth was an American mathematician who was visually impaired. He developed a system to help other people with visual impairments do math.

Like many visually impaired people, Nemeth used Braille to read and write. Braille is a system of letters that uses raised dots. It was invented in France in 1826. In Braille, six raised dots are arranged in a block or cell. Each arrangement of dots is a different letter. People touch the dots to read.

Braille works well with words. It helps those with poor or no eyesight read books. Visually impaired people also use Braille to write messages and express their thoughts in writing, but not in mathematical symbols.

In 1952, Nemeth developed a Braille system for mathematical symbols and operations. This "Nemeth Code" allowed blind people to read and write mathematical symbols and equations. For the first time, visually impaired people could use math to become scientists and engineers.

When Nemeth was a young student, counselors told him that his career options were limited. They believed that his disability made a career in math impossible. In college, they discouraged him from studying math, so he studied psychology instead.

But Nemeth proved those people wrong. He went back to school and earned a Ph.D. in mathematics. He shared his love of mathematics as a professor. Through his Braille system, he made it possible for others with visual impairments to follow in his footsteps.

FUN FACT

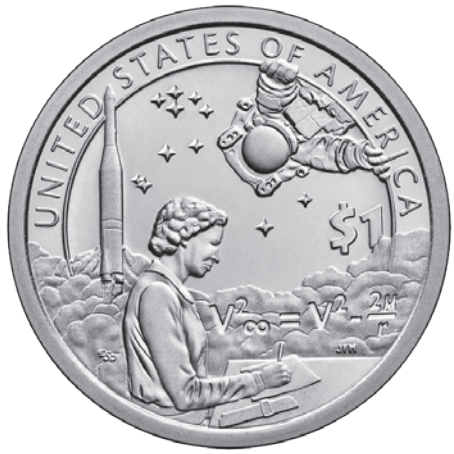
Nemeth was a skilled piano player who loved entertaining others with his music. He also had an amazing memory for facts. He enjoyed telling jokes and stories about any subject. People liked his parties.

THINK

How do you think Nemeth learned math before he developed his code?

Mary Golda Ross (1908–2008)

Mathematics Teacher and Aerospace Engineer



Mary Golda Ross was an aerospace engineer and mathematics teacher. A member of the Cherokee Nation, she was the first Native-American woman to become an engineer.

Ross taught mathematics and science for ten years. In 1938, she got a master's degree in mathematics. After that, she got a job at Lockheed Aircraft Corporation as a mathematical research assistant.

During World War II, Ross used her knowledge of mathematics to improve U.S. Air Force fighter planes. After the war ended, Ross developed missiles and satellites for the U.S. military. Then, during the 1960s, she worked with NASA to develop flight paths to Mars and Venus.

Mary Golda Ross is considered a legend by many Native-American engineers. She spent many years encouraging girls to pursue careers in STEM (Science, Technology, Engineering, and Mathematics).

FUN FACT

In 2019, the U.S. Mint issued a Sacagawea dollar featuring Mary Golda Ross on the reverse side.

THINK

How might mathematics be used in developing or engineering fighter planes, missiles, and satellites?

Karen Ellen Smith

A Mathematician and Teacher Who Studies the Mysteries of Shapes

Karen Ellen Smith is an American mathematician from the 20th century. She enjoyed mathematics from a young age and was later encouraged by a college professor to pursue it as a career.

One of Smith's biggest contributions to mathematics was her work in algebraic geometry. In her work, she studies how to use numbers and equations to describe different shapes. This helps mathematicians understand relationships between shapes and make predictions. Her work helps solve many real-world problems in areas such as robotics, architecture, and even 3D printing.

Smith's research goes beyond algebraic geometry and includes the fields of commutative algebra and algebraic number theory. She enjoys working on problems that connect different types of mathematics. She is known for her ability to explain difficult concepts in ways that are easier to understand. This makes her work valuable to other mathematicians in both research and education.

Karen Ellen Smith encourages her students to ask questions and get help when they need it. She reminds them to keep trying and not give up when faced with challenges. Her dedication to understanding geometry and its real-world uses has made her a leading figure in today's field of mathematics.

FUN FACT
Did you know that Karen Ellen Smith wrote a book called *An Invitation to Algebraic Geometry*?

THINK
How do you use shapes to help solve problems?

Marjorie Lee Browne

A Mathematician and Teacher Who Fought to Improve Mathematics Education

Marjorie Lee Browne was an American mathematician and educator. Born in the early 1900s, Browne had a love of mathematics and was determined to study the subject. Her father and stepmother encouraged her to continue her studies and sent her to a private school. By the time she graduated from high school, she was a gifted mathematics student.

After completing university, Browne worked with elementary and high school teachers to help them better understand modern mathematics. She focused especially on encouraging mathematics education for minorities and women.

Browne also researched several areas of mathematics, including linear and matrix algebra. She saw the importance of computer science and worked to raise money to bring one of the first academic computers to her university.

Throughout her career, Marjorie Lee Browne worked to help gifted mathematics students in their studies. She would even use her own money to help these students to continue their education. She is remembered for helping any student who came to her and for improving the quality of mathematics education.

FUN FACT
Did you know there is a Marjorie Lee Browne Scholarship offered at North Carolina Central University for students studying mathematics?

THINK
How can you use mathematics to solve a problem?

Sally Ride (1951–2012)

First Woman in Space

Sally Ride made history as the first woman to journey into space.

In college, Ride studied physics and English literature. In graduate school, her PhD research was about X-rays and space gas.

In 1978, Ride joined NASA after seeing an ad in the newspaper looking for young scientists to join the astronaut training program. She trained for five years in the first class of female astronauts.

On June 18, 1983, Ride made history traveling into space with four male crew members. During her first trip to space, her team performed science experiments and set up satellites. In 1984, she returned to space for a second time.

Ride later became a professor of physics at the University of California in San Diego. She started her own company, called Sally Ride Science, that works with young girls who want to have careers in science, math, and technology. Ride is also the author of 17 children's books on space and earth science.

In 1988, Sally Ride was inducted into the National Women's Hall of Fame. This is just one of the many honors that Sally Ride has received for her contributions.

FUN FACT

As a child, Sally Ride loved baseball. She was an avid fan of the Los Angeles Dodgers and dreamed of one day playing shortstop for them.

THINK

How has space exploration changed our world?

Dorothy Vaughan

A Mathematician Who Helped Astronauts Take Flight

Dorothy Vaughan was a mathematician who lived in the 20th century. She began her career as a mathematics teacher and was later recruited by NASA as part of the first group of African Americans to be hired as mathematicians and scientists.

Vaughan worked with a team of other mathematicians known as the "human computers" at NASA. They did complex calculations by hand to help send astronauts into space. Vaughan's work was crucial to the success of NASA's missions. She helped calculate important data that guided rockets and spaceships through space. Her contributions were so valuable that she was eventually recognized for her achievements and became a supervisor.

As a supervisor at NASA, Vaughan led a group of African American women working as mathematicians. She saw that computers were going to be the future, so she taught her team programming languages and other concepts to prepare them. Vaughan later led the programming section of the Analysis and Computation Division.

Dorothy Vaughan's legacy lives on as a mathematician who paved the way for other women and African Americans to pursue careers in mathematics and science. She showed that with hard work and dedication, anyone can overcome obstacles and achieve greatness.

FUN FACT
Did you know that Dorothy Vaughan's story is featured in the movie *Hidden Figures*?

THINK
How do you think mathematics is used in space exploration?

Chike Obi (1921–2008)

Groundbreaker in nonlinear differential equations

Chike Obi was a mathematical pathfinder. He earned a Ph.D. from Massachusetts Institute of Technology (M.I.T.) in 1950. This made him the first Nigerian with a doctorate in mathematics.

Obi's work broke new ground in nonlinear differential equations, a field critical to physics and engineering. His contributions earned him the 1985 Sigvard Eklund Prize from the International Centre for Theoretical Physics.

Obi was a professor at the University of Lagos and a passionate teacher and mentor. He was known to use everyday objects to teach complex mathematics. He inspired countless students to pursue mathematics and science. His influence extended beyond the classroom to shape the future of mathematics across Africa.

He was also a leader in politics. He was elected to the group that negotiated Nigeria's independence from Britain in 1960. Obi routinely spoke out against corruption in government and served briefly as a legislator.

Obi's life was a blend of brilliance, courage, and dedication to mathematics and to a better society in his beloved Nigeria.

FUN FACT

In 1997, Obi made headlines for presenting a proof of Fermat's Last Theorem. His work was later found to include errors, but the presentation reflected his willingness to tackle tough problems.

THINK

How do you think Obi's work as a mathematician influenced his approach to negotiations and problem-solving in politics?