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## Math, Faith, and the Race to Space

by Victoria McAfee

*I don't have a feeling of inferiority. Never had.  
I'm as good as anybody, but no better.*

Katherine Coleman Goble Johnson was born August 26, 1918, in White Sulphur Springs. Greenbrier County, West Virginia, the youngest daughter of Joshua and Joylette Coleman's four children. Her father was a lumberman, farmer, and handyman, while her mother taught school.

At an early age, Johnson demonstrated a God-given intellect and a superior skill in math. She started high school at 10 years old and graduated summa cum laude from West Virginia State College at 18, with degrees in mathematics and French. Later, she desegregated the graduate school at West Virginia State University, the first African-American woman to earn a master's degree there. After her undergraduate graduation, she started teaching at a black public school in Virginia.

In 1939, Johnson married her first husband, James Goble, and when she became pregnant, she quit school and concentrated on her family. Her husband died in 1956 of cancer at the age of 43, leaving her with three children to raise alone. Three years later she married James Johnson and became the first black woman to attend graduate school at the University of West Virginia. Daughters Joylette and Katherine later became teachers, while her other daughter, Constance, became a guidance counselor. She would tell them that math was not hard: "If you don't do well in math, normally it's because you had the wrong teacher, you know, or the teacher didn't like math and somebody told you it was hard."

In 1952, God opened a door for Johnson to become a mathematician at the National Advisory Committee for Aeronautics (NACA) in Hampton, Virginia, the predecessor of the National Aeronautics and Space Administration (NASA). Initially, Johnson worked in a pool of women performing math calculations referred to as "computers who wore skirts." In keeping with state racial segregation laws, Johnson and the other African-American women in the computing pool worked, ate, and used restrooms a half-mile away from their white co-workers. The men she worked with did not want her drinking out of the same coffee pot as them, so they had one exclusively for her labeled "colored."

However, Johnson stated, "Everybody there was doing research. You had a mission and you worked on it, and it was important to you to do your job. I didn't feel the segregation, I knew it was there." NASA disbanded the colored computing pool in 1958.

One day Johnson's supervisor assigned her to assist

an all-male, white flight research team. It was a tense situation, but her bosses and colleagues eventually respected her precise computations, which she made in her head, long before the days of pocket calculators and computerized flight plans. She asked to be included in editorial meetings and got her name put on reports, a first for a woman. Johnson's work is credited in several major space flights such as calculating the trajectory for Freedom 7, which put the first US astronaut, Alan Shepard, into space. She calculated the launch window for his 1961 Mercury mission. It is said that John Glenn specifically called on Johnson to check the numbers of his flight orbiting the earth and refused to start the mission unless Johnson confirmed the calculations of the new electronic computers. She also worked out the math for the 1969 Apollo 11 mission, which sent the first three men to the moon, and the aborted Apollo 13 mission. It was part of her job to get the astronauts back safely to earth after the equipment failure. She later worked on the Space Shuttle program and plans for a mission to Mars before she retired in 1986 after working 33 years for NASA.

Johnson's importance to the space program was largely unknown until author Margot Lee Shetterly wrote the book *Hidden Figures* about three African-American women, employed by NASA, who played a significant role in the space program—Doris Vaughn, Mary Jackson, and Katherine Johnson. Later, a movie of the same title was produced. Both the movie and the book have been praised as something to inspire youth, especially girls who might think math and science is just for boys.

It took years, but finally, Johnson and the other two women have been recognized for their significant contributions. When she was 96, President Obama awarded Johnson the Medal of Freedom. Following this award, on May 5, 2016, the 55th anniversary of Alan Shepard's historic rocket launch and splashdown, NASA named a building in her honor at the Langley Research Center in Hampton, where she originally worked.

In spite of all of these accomplishments, past and present, Johnson has maintained a humble spirit. Her pastor said he had no knowledge of her significant work in the space program until three years after he knew her. In spite of her serious and time-consuming job, Johnson stayed active in her church for over 50 years, singing in the choir, chairing the church's finance committee, and performing other duties in the church.

God definitely had a guiding hand throughout her life and put her in a strategic place at an important time. God used her to aide in the success of several major space programs but even more importantly, she helped save astronauts' lives that might have been lost in space or destroyed on a return flight. Those who know her personally call her a woman of courage and deep faith.



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