

The Women of Hidden Figures

by Jessica McBirney

Beginning in 1955, the United States and the Soviet Union began competing in the Space Race, a race to determine who would achieve superiority in spaceflight. The following text describes some of the people who made significant contributions to this race and who were, until recently, hidden from popular history.

- ¹ When the movie *Hidden Figures* hit theaters in December 2016, few Americans had ever heard of Katherine Johnson, Dorothy Vaughan, Mary Jackson, or any of the women who worked as “computers” behind the scenes of the Space Race in the 1960s. These women and their peers at NASA are a key part of American history. African American women did much of the difficult number-crunching for our most famous space missions, including John Glenn’s first orbit of the Earth.

The film *Hidden Figures* was based on the 2016 book, *Hidden Figures: The American Dream and the Untold Story of the Black Women Who Helped Win the Space Race* by Margo Lee Shetterly. The film and book tell the stories of three African American women who accomplished incredible things in the fields of science and mathematics, and who made great contributions to the fight for gender and racial equality.



Hidden Figures Award Ceremony

KATHERINE JOHNSON

Katherine Johnson, born in 1918, always loved numbers. She says she “counted everything,” from steps to silverware. She grew up in West Virginia, where she advanced to high school by the age of 10.

Getting a high school education was not easy for an African American student in the 1930s. The county where she lived did not offer public schooling for African American students beyond eighth grade, so she and her parents moved to a different city — Institute, West Virginia — so she could continue her education. She was clearly a gifted student, and she was exceptionally good at math. She graduated from high school at 14 and sped on to graduate from college at age 18.

- ⁵ Johnson decided to spend the next several years caring for her children at home and working as a teacher. By 1953, her children were older, and she went to work at the National Advisory Committee for Aeronautics, or NACA (which eventually came to be known as NASA in 1958). Around this time, NACA began hiring both white and black women to be “computers” — not the handy machines we have today, but skilled mathematicians who performed all the tedious¹ calculations necessary for safe space flight.

Johnson stood out as an impressive computer. Engineers at NACA used her notes and equations in lectures they gave to trainees. She completed trajectory calculations for the Freedom 7 mission² in 1961 to ensure the rocket would head in exactly the right direction.

In 1962, John Glenn, the first American to orbit the Earth, specifically requested that Johnson do all the calculations for his famous orbital mission. The government had recently begun using automated computers (more like the computers we have today) to perform these calculations, but Glenn preferred that Johnson complete them herself.

Later in her career, Johnson helped with Space Shuttle missions and authored or co-authored 26 research reports. She received the Presidential Medal of Freedom in 2015. ¹

¹ **tedious:** long and tiresome

² the first United States human spaceflight

DOROTHY VAUGHAN

In 1943, at the height of World War II, Dorothy Vaughan left her job as a math teacher in Virginia to take a temporary job in the government. She wanted to serve her country, so she worked as a computer for NACA.

- ¹⁰ A recently-signed law outlawed racial discrimination in hiring, but African American computers still had to sit in a separate office and use a separate bathroom from their white counterparts. Additionally, all the supervisors were still white.

Vaughan played the role of unofficial supervisor to her office of African American computers, managing her peers and answering questions, but she did not get paid any more to reflect her work. She addressed this problem with her superiors, and she became NACA's first black supervisor in 1949.

NACA engineers came to value her group of computers and often requested them specifically for difficult projects. They also trusted Vaughan's judgment and asked for her recommendations on whom they should hire.

As a supervisor, Vaughan had the opportunity to learn how to use NACA's first computing machines. She quickly mastered the programming language that made them work properly, and many looked to her for guidance as they learned how to use the new machines as well. **2**

MARY JACKSON

Mary Jackson was one of the computers who worked directly under supervisor Dorothy Vaughan. She joined NACA in 1951, after several career changes and earning a degree in Math and Physical Sciences.

- ¹⁵ After two years as a computer, she received an offer to work directly with one of NACA's engineers, who designed super-high-speed wind tunnels. Female engineers were almost unheard of at the time — not to mention black female engineers!

But she faced a problem; to become a full-fledged engineer, she had to complete several graduate-level courses. At the time, these classes were only held in a segregated³ high school in the evenings. Jackson had to go through the city government to get special permission to attend these classes so she could serve as a NACA engineer.

She earned her degree and became an engineer in 1958. She worked in this role for almost two decades, co-authoring reports and conducting scientific research. By 1979, Jackson had reached the highest level of the engineering department, but she grew frustrated that she was not promoted beyond that to a managerial position. Instead of continuing her career as a scientist, Jackson switched careers yet again, this time to serve NASA as the Federal Women's Program Manager. In this role she worked hard to make sure the government hired and promoted women and minorities. **3**

Each of these three women played a unique role in promoting the equality of African American women in the workplace. Katherine Johnson showed her superiors how detailed and reliable a female mathematician can be. Dorothy Vaughan proved to the administrators at NACA that she, too, could lead large groups with skill. And Mary Jackson fought discrimination to earn advanced engineering degrees that few women and African Americans before her had received. These women — and the entire group of African American mathematicians at NACA — had a remarkable impact on the push for equality.

³ to separate or divide people along racial lines

CLOSE READ QUESTIONS

1. Describe Katherine Johnson's role at NACA.
2. At first, Dorothy Vaughan was an unofficial supervisor. How did her career change? What is the significance of this change?
3. Why did Mary Jackson leave her job as an engineer?
4. Write a statement that expresses the central idea of the text. Then, provide the evidence that **best** supports the central idea.
5. How do paragraphs 10-11 contribute to the development of ideas in the text?
6. How do Jackson's and Johnson's experiences pursuing an education contribute to readers' understanding of the effects of discrimination? You must use at least two pieces of evidence to support your claim and elaborate thoroughly on your evidence.
7. How do you think the actions of Katherine Johnson, Dorothy Vaughan, and Mary Jackson changed how African American women were perceived and treated?