

Katherine Johnson: “Hidden Figure” and NASA Pioneer

Teacher’s Guide

This document is addressed to the instructor. Other documents in this lesson packet are addressed to students.

Overview:

Katherine Johnson was a NASA research mathematician who contributed to the Project Mercury spaceflights and the Project Apollo lunar missions, as well as many other efforts in her 33 years in the space program. Johnson gained worldwide respect and notoriety after *Hidden Figures*, a bestselling book by writer and entrepreneur Margot Lee Shetterly, captured her life as a gifted mathematician whose tenacity and skill defied racial and gender discrimination in science and engineering during the 1950s and 60s.

Lesson Prompt:

What type of race and gender stereotypes did women face in the workplaces of mid-twentieth century America?

How did the “space race” between the Soviet Union and the United States catapult a black woman into using her incredible math skills to serve her nation and its scientific goals?

What role does contemporary media play in giving young people exemplary role models from their country’s history?

This lesson includes a prepared PowerPoint slide deck detailing the journey of Katherine Johnson, who began as a little girl with an affinity for numbers, became one of three black students to integrate a university graduate program, and eventually, as a “human computer”, helped American astronauts explore outer space and the moon.

The lesson introduces the benefit of STEM programs and the reality of black progress and career advancement. Share the slide show and have students discuss the questions it contains; then, use the accompanying Critical Thinking Questions to measure basic comprehension and prompt further inquiry.

This lesson includes supplemental documents for in-depth engagement with the presented topics, along with Multiple Choice Questions to measure comprehension. It also includes additional resources and short, school-appropriate Video selections for additional learning and presentation opportunities.



Vocabulary:

accolades, Cold War, computer, cosmonaut, dramatic license, lunar, module, orbit, parabola, precocious, RAM, ROM, state-of-the-art, synchronize, trajectory

Recommended Resources:

Websites

Katherine Johnson Biography

www.nasa.gov/content/katherine-johnson-biography

Virginia Aeronautical Historical Society: Virginia Aviation Hall of Fame – Katherine Coleman Goble Johnson (2017)

www.vahsonline.com/pdf/Katherine-Coleman-Goble-Johnson.pdf

Smithsonian Curators Remember Katherine Johnson, NASA Mathematician Highlighted in ‘Hidden Figures,’ Who Died at 101

www.smithsonianmag.com/smart-news/smithsonian-curators-remember-katherine-johnson-nasa-mathematician-dies-101-180974262/

NASA Figures – An MIT Constellation

www.blackhistory.mit.edu/story/nasa-figures

NASA Dedicates New Facility to Katherine Johnson, the Pioneering Mathematician of ‘Hidden Figures’

www.smithsonianmag.com/smart-news/nasa-dedicates-new-facility-katherine-johnson-pioneering-mathematician-hidden-figures-180965012/

A New Memoir Tells The Life Story Of NASA ‘Hidden Figures’ Katherine Johnson

www.sciencenews.org/article/katherine-johnson-nasa-mathematician-hidden-figures-memoir

“Racism, Sexism, And Space Ventures”: Civil Rights At NASA In The Nixon Era And Beyond

<https://docslib.org/doc/2887299/racism-sexism-and-space-ventures-civil-rights-42-at-nasa-in-the-nixon-era-and-beyond>

State Launches Career Of Pioneering NASA Mathematician Katherine Johnson

wvstateu.edu/about/history-and-traditions/katherine-johnson.aspx

“Hidden Figures” and Human Computers

www.smithsonianmag.com/blogs/air-space-museum/2018/04/13/emhidden-figuresem-and-human-computers/



Books

There are plenty of books on Katherine Johnson out there, many of them intended for elementary or middle school reading levels. But *Reaching for the Moon* and the young reader's edition of *Hidden Figures* are appropriate for all high school grade levels; *My Remarkable Journey* and the original edition of *Hidden Figures* are appropriate for advanced readers.

Reaching for the Moon: The Autobiography of NASA Mathematician Katherine Johnson. Katherine Johnson. Atheneum Books for Young Readers, 2020.

Hidden Figures: Young Reader's Edition. Margot Lee Shetterly. Harper Collins, 2016.

Hidden Figures. Margot Lee Shetterly. William Morrow, 2016.

My Remarkable Journey: A Memoir. Katherine Johnson, with Joylette Hylick and Katherine Moore. Amistad, 2021.

Other Resources

Want students to watch the film version of *Hidden Figures*? Here are some useful articles about the film *Hidden Figures* and how it compares with the non-fiction book and the real events it describes, both in terms of the events and the science and technology featured:

[Katherine Johnson, Hidden Figures, and John Glenn's Flight](https://airandspace.si.edu/stories/editorial/glenn-johnson-hidden-figures)

<https://airandspace.si.edu/stories/editorial/glenn-johnson-hidden-figures>

[A Curator Goes to the Movies: The Stuff of Hidden Figures](https://americanhistory.si.edu/blog/hidden-figures)

<https://americanhistory.si.edu/blog/hidden-figures>

[History vs. Hollywood: Hidden Figures](http://www.historyvshollywood.com/reelfaces/hidden-figures/)

www.historyvshollywood.com/reelfaces/hidden-figures/

This lesson pack also contains two articles for students: a 2008 NASA profile and a 2010 report on Johnson's visit to a high school from *The Fayetteville Observer*.