NAME _____

DATE _____

CLASS _____

SPACE TECH SERIES

Katherine Johnson

The Trajectory Trailblazer

Katherine Johnson: Charting a Path to the Stars

Katherine Johnson was born in West Virginia in 1918 and showed a gift for mathematics from a very young age. She graduated from college at just 18 years old and later joined the group that would become NASA, where she worked as a research mathematician.

At NASA, Katherine calculated trajectories, the curved paths that spacecraft follow through space. In 1961 her calculations helped launch Alan Shepard, the first American in space. Her work required incredible precision, because even a tiny error could send a spacecraft off course.

In 1962, astronaut John Glenn prepared to become the first American to orbit Earth aboard Friendship 7. NASA had begun using electronic computers, but Glenn did not fully trust the new machines. He asked engineers to "get the girl" to check the numbers by hand, meaning Katherine. She spent days recomputing the flight, and her answers matched the computer. Glenn flew safely.

Katherine went on to help with the Apollo missions to the Moon and the Space Shuttle program. For decades her work was little known outside NASA. In 2015 she received the Presidential Medal of Freedom, and her story reached millions through the book and film "Hidden Figures." She died in 2020 at the age of 101.

Part 1 · Reading Comprehension

1. What is a trajectory, and why was Katherine's work on trajectories so important?

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2. Why did John Glenn want Katherine to check the numbers even though NASA had computers?

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3. Name two major space programs Katherine contributed to after Friendship 7.

4. How did the public learn about Katherine's story decades later?

Part 2 · Critical Thinking

For many years, Katherine Johnson's contributions were not widely known. Why do you think some important scientists and their achievements go unrecognized for a long time, and why does it matter that we tell their stories now?

Part 3 · STEM Challenge

Orbiting Earth with Friendship 7

John Glenn's capsule Friendship 7 traveled at about 28,000 km/h. One full orbit around Earth is about 42,000 km long, and Glenn completed 3 orbits. Use speed, distance, and time to check the flight.

1. What total distance did Friendship 7 travel in 3 orbits? (3 x 42,000 km)

2. How long does ONE orbit take at 28,000 km/h? Use time = distance / speed (42,000 / 28,000).

3. How long do 3 orbits take? (3 x 1.5 hours)

4. Convert 4.5 hours into minutes. (4.5 x 60)