The Women Who Helped Build NASA

In the early days of space travel, complicated calculations were not done by electronic computers but by people who were known as human computers. Some of the calculations that these incredible people wrote were as long as several books! Read on to discover more about four inspirational women who worked as human computers at NASA's (originally known as NACA) Langley Research Centre in Virginia, United States.

Dorothy Vaughan

Dorothy Vaughan was born on 20th September 1910. She was an incredible mathematician who helped with lots of different research at the Langley research centre.

When she was younger, Dorothy loved maths. In 1929, she graduated with a degree in mathematics. To begin with, she worked as a maths teacher before starting work at NACA.

When Dorothy began working for NACA, there were laws in place that meant that Black workers were **segregated** from White workers. As a result, Dorothy and other Black workers had to work in separate offices (called the West Area Computing Unit) and eat on a separate table at lunch time.

In 1949, Dorothy became the supervisor of the West Area Computing Unit. This meant that she was the first Black manager at NACA.

Katherine Johnson

Born Creola Katherine Coleman on 26th August 1918, Katherine Johnson worked on lots of early space missions.

In 1937, Katherine gained a degree in mathematics and French. In 1953, she started working with Dorothy Vaughan at the West Area Computing Unit.

NACA became NASA in 1958 and the offices stopped being segregated. When this happened, Katherine became a member of the Space Task Group. This meant that she was a part of the team who worked out where and when to launch the Apollo 11 rocket so that it could reach the moon.

In 2016, NASA named a research facility after Katherine and her amazing work.

Mary Jackson

Mary Jackson was born on 9th April 1921. While at university, Mary earned a degree in mathematics and physical science. She worked as a maths teacher before joining the West Area Computing Unit.

A few years later, Mary began to work with an engineer at NACA who was investigating the effects of strong winds on a rocket ship. The engineer was so impressed with Mary that he suggested that she trained to become an engineer.

At the time, schools in Virginia were still segregated so Mary had to get special permission to allow her to study alongside White students. After receiving the permission, Mary completed the courses and became NACA's first Black female engineer in 1958.

In 2020, NASA announced that they were going to name their headquarters in Washington DC after Mary to commemorate the amazing work that she did for them.

Dr Christine Darden

Dr Christine Darden was born on 10th September 1942. She worked at NASA for 40 years before retiring in 2007.

After earning a degree in mathematics, Christine began working as a human computer for NASA. After several years, she wondered most of the engineers – who worked on important projects – were men. She also wondered why most of the women worked on the complex calculations but didn't get to conduct their own research.

As a result, Christine asked a manager why there weren't more female engineers. He told Christine that it was because nobody had thought to ask that question before. Within a short space of time, she had been promoted and began working as an engineer.

In total, Christine wrote more than 50 papers that spoke about the research that she had conducted.

Glossary

segregated: Separated or divided along racial, religious or other lines.

Questions

1. Who earned a degree in both mathematics and physical science? Tick one.
   - ○ Dorothy Vaughan
   - ○ Katherine Johnson
   - ○ Mary Jackson
   - ○ Dr Christine Darden

2. Number the events from 1-4 to show the order that they happened in.
   - ☐ NASA named their headquarters after Mary Jackson.
   - ☐ Dr Christine Darden retired from her work at NASA.
   - ☐ NASA named a research facility after Katherine Johnson
   - ☐ Dorothy Vaughan graduated with a degree in mathematics.

3. What did Katherine Johnson do as part of the Space Task Group?

   _____

4. Who was NACA's first Black female engineer?

   _____

5. **Christine wondered why most of the women worked on the complex calculations but didn't get to conduct their own research.**
   Explain what the word **conduct** means in this sentence.

   _____

6. Do you think that people who read this text will be inspired to become mathematicians? Explain your answer.

   _____

   _____

   _____

7. **Some of the calculations that these incredible people wrote were as long as several books!**
   Explain why you think that the author chose to include this sentence.

   _____

   _____

   _____

8. In the future, do you think that NASA will name buildings after Dorothy Vaughan and Dr Christine Darden? Explain your answer.

9. Imagine that you are Dr Christine Darden about to talk to the manager.
Explain how you are feeling.

Answers

1. Who earned a degree in both mathematics and physical science? Tick one.
   - ○ Dorothy Vaughan
   - ○ Katherine Johnson
   - ☑ **Mary Jackson**
   - ○ Dr Christine Darden

2. Number the events from 1-4 to show the order that they happened in.

4	NASA named their headquarters after Mary Jackson.
2	Dr Christine Darden retired from her work at NASA.
3	NASA named a research facility after Katherine Johnson
1	Dorothy Vaughan graduated with a degree in mathematics.

3. What did Katherine Johnson do as part of the Space Task Group?
   Katherine Johnson was a part of the team who calculated where and when to launch the Apollo 11 rocket so that it could reach the Moon.

4. Who was NACA's first Black female engineer?
   Mary Jackson was NACA's first Black female engineer.

5. **Christine wondered why most of the women worked on the complex calculations but didn't get to conduct their own research.**
   Explain what the word **conduct** means in this sentence.
   Accept any appropriate definition, such as: The word conduct means to take part in their own research.

6. Do you think that people who read this text will be inspired to become mathematicians? Explain your answer.
   Pupils' own responses, such as: I think that people will be inspired to become mathematicians because the four people in this text were all amazing and got to work on some really exciting projects like the Apollo 11 Moon landing.

7. **Some of the calculations that these incredible people wrote were as long as several books!**
   Explain why you think that the author chose to include this sentence.
   Pupils' own responses, such as: I think that the author chose to include this sentence so that you could get an idea of how much work the human computers had to do. This is because it is difficult to imagine having to work out complex calculations without using a computer.

8. In the future, do you think that NASA will name buildings after Dorothy Vaughan and Dr Christine Darden? Explain your answer.
   Pupils' own responses, such as: Yes, I think that NASA will name buildings after Dorothy Vaughan and Dr Christine Darden. This is because they have also contributed amazing things to the work of NASA so their hard work will probably be commemorated too.

9. Imagine that you are Dr Christine Darden about to talk to the manager.
   Explain how you are feeling.
   Pupils' own responses, such as: I am feeling really nervous because I don't know what he's going to say. I really want to be an engineer but women don't seem to be so I'm worried that he'll just tell me to go away.