

# A TEACHER'S GUIDE TO



*Wm*  
MORROW

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## Contents

About the Book	3
About the Author	3
Discussion Questions	3
Chapter 1: A Door Opens	3
Chapter 2: Mobilization	3
Chapter 3: Past Is Prologue	3
Chapter 4: The Double V	4
Chapter 5: Manifest Destiny	4
Chapter 6: War Birds	4
Chapter 7: The Duration	4
Chapter 8: Those Who Move Forward	4
Chapter 9: Breaking Barriers	4
Chapter 10: Home by the Sea	5
Chapter 11: The Area Rule	5
Chapter 12: Serendipity	5
Chapter 13: Turbulence	5
Chapter 14: Angle of Attack	5
Chapter 15: Young, Gifted, and Black	6
Chapter 16: What a Difference a Day Makes	6
Chapter 17: Outer Space	6
Chapter 18: With All Deliberate Speed	6
Chapter 19: Model Behavior	6
Chapter 20: Degrees of Freedom	6
Chapter 21: Out of the Past, the Future	7
Chapter 22: America is for Everybody	7
Chapter 23: To Boldly Go	7
Writing Prompts	7

## About the Book

Katherine Goble (later, Johnson), ever-confident in her mathematical ability and intellect, told her bosses at Langley, “Tell me where you want the man to land, and I’ll tell you where to send him up.” The man in question: an astronaut; the context: the space race that overtook the imagination of a generation; some of the main players who helped achieve some of NASA’s greatest achievements: a group of African American women mathematicians.

With rich historical detail and keen understanding, Shetterly brings alive the struggles of these four women—at turns spunky, intelligent, determined, and patriotic—whose work forever changed the face of the space agency, and the country.

## About the Author

Margot Lee Shetterly is a writer who grew up in Hampton Virginia, where she knew many of the women in *Hidden Figures*. She is an Alfred P. Sloan Foundation Fellow and the recipient of a Virginia Foundation of the Humanities grant for her research into the history of women in computing. She lives in Charlottesville, VA.

## Discussion Questions

### CHAPTER 1: A DOOR OPENS

- What are some reasons for wanting more mathematicians at Langley in the early 1940s?
- In what ways was Melvin Butler, the personnel officer at Langley, progressive in his hiring practices? In what ways was he restricted by convention? Do you think he did the best he could under the circumstances?
- Who is A. Philip Randolph and how does he help building the work force at Langley?

### CHAPTER 2: MOBILIZATION

- Describe Dorothy Vaughan: what is she like? What do you learn of her background?
- What kinds of employment opportunities were available to African American women at this time?
- Why is the opportunity for a job at Langley so unique to Dorothy?
- In her application, Dorothy she could be ready to accept employment at Langley within 48 hours. Why do you think she makes that claim?

### CHAPTER 3: PAST IS PROLOGUE

- How did Dorothy handle the balance between her family life and work aspirations?
- What does this job mean for Dorothy in terms of social mobility?
- From what we know so far, in what ways do Dorothy and Katherine’s experiences mirror each other? In what ways are they different?

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## CHAPTER 4: THE DOUBLE V

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- What is life in Newport News like for Dorothy?
- How does the civil rights movement take shape during this time period?
- To what does the chapter title, the double V, refer?

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## CHAPTER 5: MANIFEST DESTINY

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- Are the women who become “girl computers” held to a higher standard? Or do they hold themselves to one? Why or why not?
- Why does Miriam Mann keep removing the cafeteria sign? What does her act of defiance represent?
- In what ways is working at NACA progressive? In what ways does NACA stick to southern conventions?
- How were Malcolm MacLean and Henry Reid helpful to and supportive of their new colleagues?

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## CHAPTER 6: WAR BIRDS

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- To whom does the phrase “tank Yanks” refer?
- Why did locals think of Langley employees as “more than a little peculiar”?
- What is the Reynolds number? How was Dorothy able to learn about it? How does the Reynolds number help work at Langley?
- How do you think Langley employees reconcile the difference between the work they do that is innovative and advances humankind with the work they do that destroys it?

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## CHAPTER 7: THE DURATION

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- What makes Newsome Park an attractive place for Dorothy to live? How does it differ from Newport News?
- How did the end of the war and V-J Day change working conditions in the U.S.? What did it mean for women, in particular?
- Why does Virginia senator Harry Byrd oppose the FEPC?

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## CHAPTER 8: THOSE WHO MOVE FORWARD

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- Describe Katherine Goble: where is she from? What is she like? In what ways are she and Dorothy Vaughan similar?
- Who is William Waldron Schieffelin Claytor? How did he influence Katherine?
- What are the circumstances leading to Katherine’s enrollment at West Virginia University? What was her time at West Virginia like?

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## CHAPTER 9: BREAKING BARRIERS

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- How does specializing in a particular subfield of aeronautics help the girl computers?
- What accomplishment makes Doris Cohen noteworthy? How does it transform possibilities for other women?
- Is it surprising to learn that on the east side of Langley’s campus white laboratory staff didn’t know an all-black computing group existed? Why or why not?
- Who is Blanche Sponsler? Under what circumstances does Blanche leave Langley? How does Blanche’s story highlight the pressure these women are under?

## CHAPTER 10: HOME BY THE SEA

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- Describe Mary Jackson: What do we learn about her background? How is she similar to Dorothy Vaughan and Katherine Goble?
- How does Mary embody and enact her family's motto of "sharing and caring"?
- In what ways did the trial of Julius and Ethel Rosenberg affect life at Langley?
- How do the racial problems in the United States in the 1940s and 1950s change the perception of the U.S. abroad? How is this used as propaganda by the Soviet Union?

## CHAPTER 11: THE AREA RULE

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- What event prompted Mary to accept an offer to work with Kaz Czarnecki?
- What kind of disagreement did Mary and John Becker have? Do you think it is a moment that Mary will use as motivation in the future?
- What is the Area Rule? How did it impact everyday aviation?

## CHAPTER 12: SERENDIPITY

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- How did Katherine Goble get her job at Langley?
- Why did Katherine get attached to the Flight Research Division? Why is this change of department significant for her?
- What happened when Katherine sits down to wait to meet her new boss? What impact does this moment have on her?
- How does integration happen at Langley?

## CHAPTER 13: TURBULENCE

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- How does Dorothy Vaughan help Katherine and a white computer?
- What kind of research does the Maneuver Loads Branch do?
- Katherine's first assignment was to investigate the crash of a small Piper propeller plane. What is learned as a result of her contribution?
- There are two places in Langley in which Katherine refuses to conform with southern convention. What are these places, and why is her refusal to conform significant? How does her reaction differ from Miriam Mann's?
- What tragedy reshapes Katherine's family? How does it change it?

## CHAPTER 14: ANGLE OF ATTACK

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- In what ways did advances in aeronautical research change the methods by which Langley worked?
- How did the machines affect female mathematicians?
- How was the fight for social equality affecting education? How would those practices affect Langley recruitment?
- In what ways is Mary's transition to engineer significant?

## CHAPTER 15: YOUNG, GIFTED, AND BLACK

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- How does the black press link the desegregation of southern schools and the launch of *Sputnik*? What do you think is the reason behind doing so?
- Who is Christine Mann? How are events of the civil rights movement impacting her?
- How did the Soviets having engineering schools dominated by women play in American press, especially in papers like the *Washington Post*?

## CHAPTER 16: WHAT A DIFFERENCE A DAY MAKES

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- How does *Sputnik* create interest in U.S. participation in the space race?
- How does NACA become NASA? Why is the change deemed necessary?
- What kind of technological advancements occur as this space race begins to heat up?
- What does the change to NASA do for the employees of West Computing?

## CHAPTER 17: OUTER SPACE

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- Why does the President's Advisory Committee on Science say a space program is in the interest of every American? What are the reasons it gives?
- How does the nature of Katherine's work change as her department shifts from aeronautical to space?
- Why does Katherine want to go to the editorial meetings? Why is her desire to do so significant?

## CHAPTER 18: WITH ALL DELIBERATE SPEED

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- What was the selection criteria for picking astronauts for missions? Who were the four selected?
- How did Katherine's work fit in the context of the space race? What sorts of work did she do?
- What is the name of Katherine's report for NASA? Why is it so significant for both her and the department?

## CHAPTER 19: MODEL BEHAVIOR

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- What did Mary Jackson and her son, Levi, build together?
- In what ways does the soap box derby represent the breaking down of racial boundaries?
- How does Mary make female participation in engineering and the sciences visible to school-age young women? Why is her work as a role model important?
- After winning the derby, what does Levi tell the *Norfolk Journal and Guide*? Why is his comment significant?

## CHAPTER 20: DEGREES OF FREEDOM

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- How does Hampton Institute get involved in the civil rights movement?
- In what ways does the rise of computing and advancements in computing technology affect the girl computers?
- What were the series of Mercury missions? How did they lead to *Freedom 7*?
- What challenge did President Kennedy give to the space program? How do they receive this challenge?

## CHAPTER 21: OUT OF THE PAST, THE FUTURE

- Who is the astronaut chosen by NASA for manned space flight?
- How is the Soviet Union still pulling ahead in the space race?
- How does Katherine Johnson's role change as we get closer to Glenn's flight? What kinds of work is she now doing?
- Who were the other West Computers that played a part in Glenn's flight? How did they play a part in it?
- What was Glenn's experience in *Friendship 7*? Do you consider the mission successful?

## CHAPTER 22: AMERICA IS FOR EVERYBODY

- In what ways was the March on Washington for Jobs and Freedom significant?
- How did Christine Darden get to NASA?
- What is the risk standard for the Space Task Group? How do the astronauts feel about the risks they're taking?

## CHAPTER 23: TO BOLDLY GO

- Where did Katherine watch the moon landing from? Why is the location and people she was with significant? Were you surprised to learn that's where she was?
- Why did some people think the space program was a waste of money? Do you agree with their argument?
- How is the actress Nichelle Nichols talked into staying in her role on *Star Trek*? Why is that role significant to African Americans at this time? What kind of progress does it represent?
- What kind of accomplishment was it for Katherine and the workers of Langley for the *Eagle* to land safely during the *Apollo* mission on the surface of the moon?

### Writing Prompts

- *Hidden Figures* uncovers the story of the women whose work at NACA and NASA helped shape and define U.S. space exploration. Taken as a whole, why is their story significant to our cultural, social, and scientific history?
- In what ways does the race for space parallel the civil rights movement? What kinds of freedoms are being explored in each?
- In Chapter 23 we learned that some people thought that spending money on space exploration was wasteful when there were so many other problems in the United States. Do you think the U.S. achieved a balance between innovation in space exploration and advancing the civil rights of all its citizens during this time period? Would you have done things differently?
- Would you consider NACA and NASA socially progressive institutions for their time? Why or why not?
- In advocating for herself to work on the *Mercury* capsule launch, Katherine says to her bosses, "Tell me where you want the man to land, and I'll tell you where to send him up." How are the women in *Hidden Figures* able to express confidence in their work and abilities? In what ways is that confidence validated by their coworkers? Why is this emotional experience such an important part of their story?

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