

## Lesson Plan

### Meet Four Pioneering African American Astronauts



*Clockwise from top left: Michael P. Anderson, Ronald E. McNair, Guion S. Bluford Jr., Jeanette J. Epps, Images Courtesy of Wikimedia Commons.*

**Grade Level(s): 9-12**

**Subject(s): History**

**In-Class Time: 50 min**

**Prep Time: 10-15 min**

### Materials

- Photocopies of NASA's African American Astronauts, [http://www.nasa.gov/pdf/286592main\\_African\\_American\\_Astronauts\\_FS.pdf](http://www.nasa.gov/pdf/286592main_African_American_Astronauts_FS.pdf).
- Photocopies of NASA Ronald E. McNair Biography, <http://www.jsc.nasa.gov/Bios/htmlbios/mcnair.html>
- Photocopies of NASA Michael Anderson Biography, <http://www.jsc.nasa.gov/Bios/htmlbios/anderson.html>.
- Photocopies of NASA Jeanette J. Epps Biography, <http://www.jsc.nasa.gov/Bios/htmlbios/epps-ji.html>.
- Photocopies of NASA Guion S. Bluford, Jr. Biography, <http://www.jsc.nasa.gov/Bios/htmlbios/bluford-gs.html>.

### Objective

This lesson focuses on four astronauts and scientists who have a background in physics or a related discipline – Ronald E. McNair, Michael Anderson, Guion S. Bluford Jr., and Jeanette J. Epps. A link to a full list of all African American astronauts is included in the Further Reading and Additional Resources section along with a website dedicated to providing biographies on all current and retired astronauts.

### Introduction

The history of NASA, like all American institutions, must always be contextualized within the larger framework of American Society. Before the middle of the twentieth century, racism and segregation barred most African Americans from being able to work at NACA, the National Advisory Committee for Aeronautics and the predecessor of NASA. But since World War II, African Americans have played an increasingly integral role in the research and operations of NASA, from the support staff on the ground, to engineers and scientists, to the astronauts who selflessly risk their lives on every trek into space. Before the end of legalized segregation, many African American engineers and scientists were performing scientific work for NASA at a time in which it was against the law for them to use the same bathroom as their white co-workers.<sup>1</sup>

The NASA Astronaut Corps was formed in 1959. The first astronaut candidates were selected in 1959 for Project Mercury the goal of which was to successfully orbit astronauts around the Earth. After an intense screening process within the military, NASA selected the “Mercury Seven” – Alan Shepard, Gus Grissom, John Glenn, Scott Carpenter, Wally Schirra, Gordon Cooper, and Deke Slayton. The first African American chosen to be an astronaut was Air Force Major Robert H. Lawrence who was chosen in the

<sup>1</sup> For more information on integration at NASA, see Richard Paul, “How NASA Joined the Civil Rights Revolution,” *Air & Space Magazine*, March 2014, <http://www.airspacemag.com/history-of-flight/how-nasa-joined-civil-rights-revolution-180949497/?no-ist>.

1960s. He had earned a doctorate in physical chemistry from Ohio State University in 1965. Tragically, Lawrence died in a plane crash at Edwards Air Force Base, California on December 8, 1967. It was not until 1983 that Guion Bluford would become the first African American in space. In this lesson plan, students will meet Guion Bluford and three other African American astronauts with backgrounds in physics or a related discipline – Ronald McNair, Michael Anderson, and Jeannette Epps. They are four of the many African Americans who contributed to NASA’s work with human spaceflight since World War II.

### Instructions/Activities

1. Divide the class into four groups and assign each group one of the astronauts.
2. Give each group the printouts of the NASA biographies.
3. Students will carefully read the biographies of each astronaut and write down any questions they have about the reading. Encourage the students to reflect upon the reading and write down anything that comes to mind concerning how race affected the lives, education, and careers of the astronauts.
4. The groups will then give a presentation on the astronaut they learned about to the class.

### Required/Recommended Reading and Resources

#### NASA Biographies:

- Lyndon B. Johnson Space Center. "Astronaut Bio: Ronald E. McNair (12/2003)." Astronaut Bio: Ronald E. McNair (12/2003). <http://www.jsc.nasa.gov/Bios/htmlbios/mcnair.html> (accessed June 18, 2014).
- Lyndon B. Johnson Space Center. "Astronaut Bio: Michael P. Anderson (5/2004)." Astronaut Bio: Michael P. Anderson (5/2004). <http://www.jsc.nasa.gov/Bios/htmlbios/anderson.html> (accessed June 18, 2014).
- Lyndon B. Johnson Space Center. "Astronaut Bio: Jeanette J. Epps (5/2012)." Astronaut Bio: Jeanette J. Epps (05/2012). <http://www.jsc.nasa.gov/Bios/htmlbios/epps-jj.html> (accessed June 18, 2014).
- Lyndon B. Johnson Space Center. "Astronaut Bio: Guion S. Bluford, Jr. (2/2012)." Astronaut Bio: Guion S. Bluford, Jr. (2/2012). <http://www.jsc.nasa.gov/Bios/htmlbios/bluford-gs.html> (accessed June 18, 2014).

#### Additional Resources:

- Gubert, Betty Kaplan, Miriam Sawyer, and Caroline Fannin. *Distinguished African Americans in Aviation and Space Science*. Westport, CT: Oryx Press, 2002.
- Jones, Stanley P. and L. Octavia Tripp. *African-American Astronauts*. Mankato, MN: Capstone Press, 1998.
- McNair, Carl S., and H. Michael Brewer. *In the spirit of Ronald E. McNair, astronaut: an American hero*. Atlanta, GA: Publishing Associates, 2005.
- Naden, Corrine. *Ronald McNair: Astronaut*. New York: Chelsea House Publishers, 1991.
- Haskins, James and Kathleen Benson. *Space Challenger: The Story of Guion Bluford*. Minneapolis: Carolrhoda Books, 1984.
- Jeffrey, Laura S. *Guion Bluford: A Space Biography*. Springfield, NJ: Enslow Publishers, 1998.

- Guion Bluford (The HistoryMakers ScienceMakers Video Archive A2013.165), interview by Larry Crowe, 05/09/2013, The HistoryMakers ScienceMakers Video Archive. <http://www.thehistorymakers.com/biography/guion-bluford>. The ScienceMakers Digital Archive contains an extensive oral history video interview with Guion Bluford in which he discusses his life, education, and career.

### Discussion Questions

1. How did the astronaut's backgrounds prepare them for their intensive training and space experiences?
2. Assume that you are an astronaut instructor training Ronald McNair, Michael Anderson, Guion S. Bluford, or Jeanette J. Epps. What advice would you give them?
3. All four astronauts have a background in physics or a closely related field. What other careers can you think of for which physics might prepare you well?
4. Compare and contrast this group of astronauts. What do they have in common? What makes each of them different?

### Further Reading and Additional Resources

- [NASA's African American Astronauts](#) – A two-page document which contains short biographies and photographs for sixteen African American astronauts.
- [NASA Astronaut Biographies](#) – This is a comprehensive resource provided by NASA that provides biographies of current and former astronauts.
- Video - [NASA Remembers Challenger](#) (3 min, 49 sec) – This video discusses the tragic Challenger explosion of 1986 in which astronaut and physicist Ron McNair passed away.
- “Race and the Space Race: The Unlikely Story of Civil Rights and the Space Program” (59 min, 18 sec) – A PRX radio documentary, narrated by African American astronaut Mae Jemison, which discusses civil rights and the space age, <http://www.prx.org/pieces/41113-race-and-the-space-race#description>.
- Richard Paul, “How NASA Joined the Civil Rights Revolution,” *Air & Space Magazine*, March 2014, <http://www.airspacemag.com/history-of-flight/how-nasa-joined-civil-rights-revolution-180949497/?no-ist>.
- Cape Cosmos, <http://www.capecosmos.org/>. Cape Cosmos is a fictitious space facility set in the 1950s and 1960s that students can tour to learn about the struggles and triumphs of women and African Americans working in the Space Program and NASA. The tour is narrated by African American astronaut Mae Jemison.

### Extensions

Related Resources from the AIP African Americans in Physics, Astronomy, and Related Disciplines

Teacher's Guide:

- African Americans and Space Crossword Puzzle
- Other lesson plans on African Americans and Space:
  - African Americans in Astronomy and Astrophysics
  - Katherine Johnson, Christine Darden, and the West Area Computers: African American Women Mathematicians at NASA

Other Extensions:

- NASA “Train Like an Astronaut,” <http://www.nasa.gov/audience/foreducators/trainlikeanastronaut/home/#.VFqf2PnF9v8>.

**Common Core Standards**

For more information on Common Core Standards, visit <http://www.corestandards.org/>.

History/Social Studies	
<a href="#">CCSS.ELA-LITERACY.RH.9-10.1</a>	Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.
<a href="#">CCSS.ELA-LITERACY.RH.9-10.2</a>	Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
<a href="#">CCSS.ELA-LITERACY.RH.11-12.2</a>	Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.
<a href="#">CCSS.ELA-LITERACY.RH.11-12.3</a>	Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.

**Next Generation Science Standards**

N/A For more information on the Next Generation Science Standards, visit <http://www.nextgenscience.org/>.